Scientific American.

A JOURNAL OF PRACTICAL INFORMATION IN ART, SCIENCE, MECHANICS, AGRICULTURE, CHEMISTRY, AND MANUFACTURES

VOL. III.—No. 9. NEW YORK, AUGUST 25, 1860. NEW SERIES.

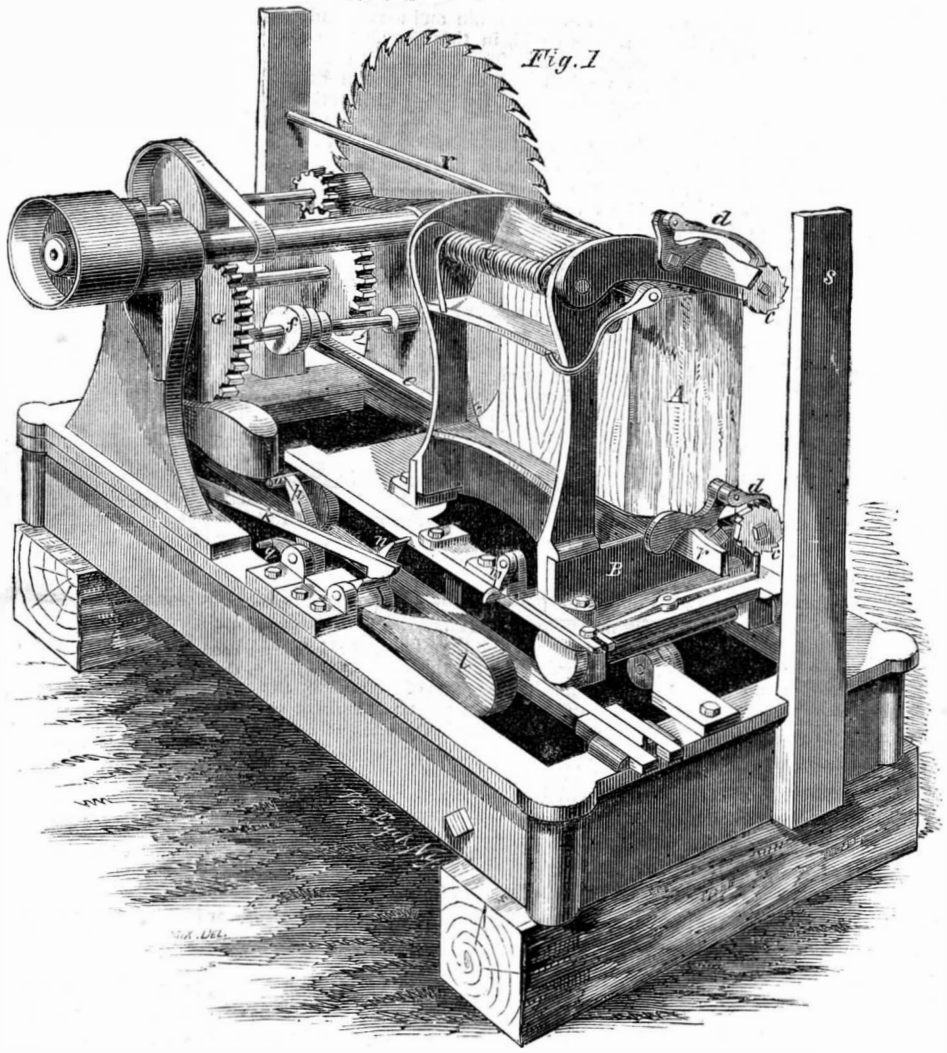
IMPROVED SHINGLE MACHINE.

This machine belongs to that class of inventions which are always most satisfactory for us to describe, and no doubt for our readers to investigate; we mean machines which are invented and improved by practical mechanics, the improvements having been suggested by actual operation. One patent has already been obtained for the principal features illustrated in this machine, and application has been lately made, through the Scientific American Patent Agency, for some improvements in the details.

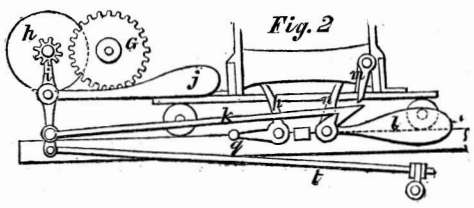
The bolt, A, to be sawed into shingles, is placed in the carriage, B, with the grain of the wood vertical. From this position of the wood, the tapering form is given to the shingle, by advancing the upper end of the block more than the lower end; and after one shingle is cut, the block is adjusted for the succeeding shingle, by advancing the lower end more than the upper. For effecting this adjustment, the bolt is held between two serrated rollers, one at the top and the other at the bottom, and the shafts of these rollers have ratchet wheels, *c c*, upon their ends. These wheels are operated by the pawls, *d d*, and their teeth consist of a long and short tooth placed alternately. When the roller at the upper end of the block is turned the distance of the long tooth, the roller at the bottom is turned the distance of the short tooth, and after this adjustment the shingle is cut with its butt at the top of the block. For the succeeding shingle the arrangement is reversed. The block is fed to the saw by drawing along the carriage, B, which motion is effected by the winding of the belt, *e*, around one of the cone of pulleys, *f*.

The device for gigging back the carriage is somewhat complicated, but is fully illustrated in Fig. 2. The gear wheel, G, upon the shaft of the pulley, *f*, is carried by the small pinion, *h*, which is placed upon the end of the lever, *i*. Secured rigidly to the lever, *i*, near or at its fulcrum is the heavy arm, *j*, which if not restrained, descends by its own weight and thus so turns the lever, *i*, as to carry the pinion, *h*, into gear with the wheel, G. When, however, it is desired to throw the pinion, *h*, out of gear with the wheel, G, in order to allow the carriage to be drawn back after the shingle is cut, the hook upon the end of rod, *k*, is caught by the notch on the lever, *l*, which in descending, turns the lever, *i*, in the position shown, thus permitting the wheel, G, to stop in its rotations. The lever, *l*, is turned up so that the notch upon it may catch into the hook on the rod, *k*, by means of the tongue, *m*, upon the carriage coming against the toe, *n*, upon the lever. These parts are so arranged that the pinion, *h*, is drawn out of gear, just as the cutting of the shingle is completed, when the carriage is drawn back by a weight acting over a pulley. As the carriage comes back to the starting place, a pin, *o*, upon it comes in contact with one arm, *m*, of a bent lever which has the pin, *q*, upon its opposite arm; this carries up the pin, *q*, and throws the rod, *k*, out of connection with the notch upon lever, *l*, thus allowing the pinion, *h*, to fall back into gear with the wheel, G. As the carriage comes back, the rods, *r r*, are brought into contact with the permanent upright post, S, which causes the levers which operate the pawls, *d d*, to slide along the inclined-plane enlargements on the rods, and thus to turn the rollers, *c c*. A rod, *t*, Fig. 2, is attached to the lower end of the lever, *i*, to enable the operator to throw the wheel, G, out of gear at will. The upper one of the serrated rollers, *c c*, is secured in arms which are hinged to the carriage and pressed downward by the spiral spring, W. Those motions of the machine not here fully described are effected by the usual and well-known mechanical devices.

Any further information in relation to this invention, may be obtained by addressing the inventor J. R. Hall, at Brunswick, Maine, or Messrs. Sharp Davis & Bonsill, of Salem, Ohio.



HALL'S IMPROVED SHINGLE MACHINE.

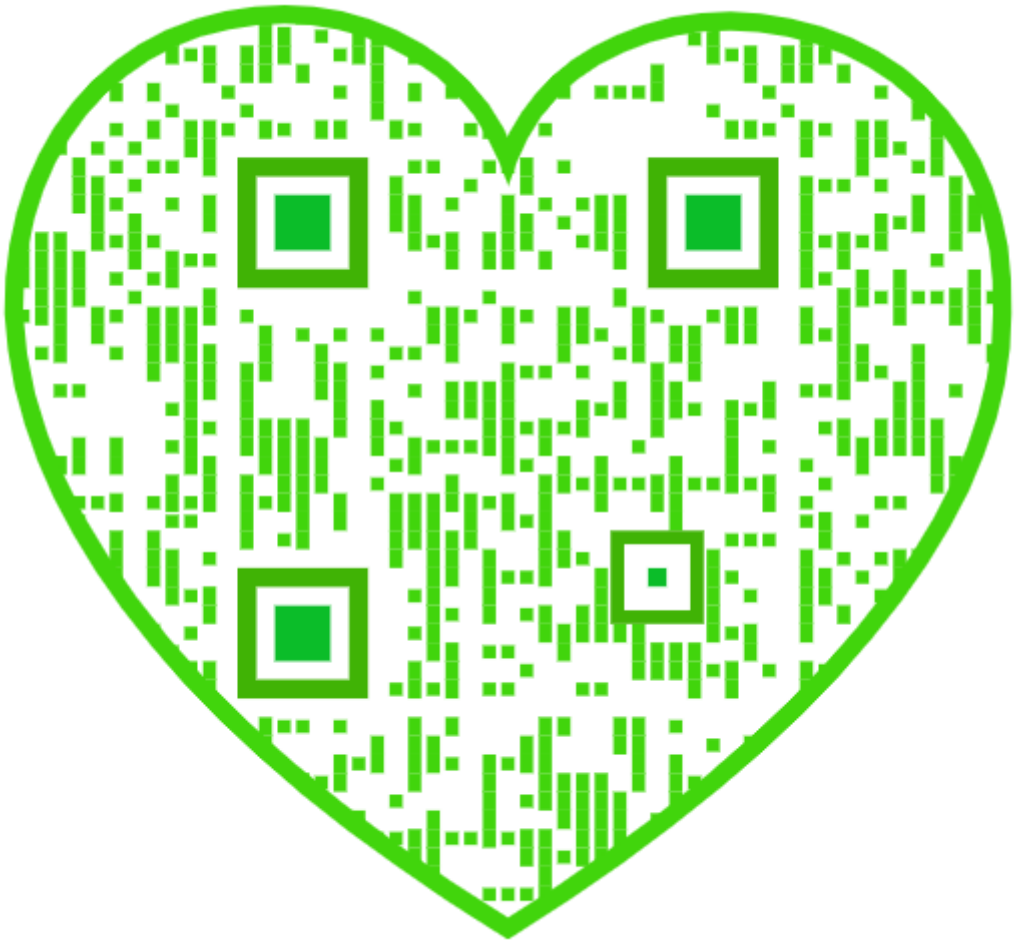


ROLLING SHIPS.

The cause of some ships rolling more than others at sea is generally attributed to their particular form of hull—the circular barrel shape being held exceedingly favorable for producing that peculiar heaving sensation denominated *sea-sickness*. Some new ideas of an apparently scientific character were lately presented before the British Association for the Advancement of Science, by Mr. Fronde on this subject, who stated that he had long been of opinion that the *heavy* rolling of a ship depended on her own periodic time—considering her as a pendulum—concurring with the periodic recurrence of the waves. The periodic time of a ship vibrating as a pendulum depended on her stability and moment of inertia, and it had been found that the period was almost exactly the same when rolling naturally on waves as when set rolling in smooth water. Thus, if the period of a ship's vibration was ten seconds, and she was in a sea the waves of which recurred in six seconds, she would not roll much; but if the waves attained a ten-second period, she would roll excessively. This was proved by the British war-ship *Duke of Wellington*. Her periodic time of vibration had been ascertained to be twelve seconds, and in her previous trials on the Baltic and narrow seas, where short quick waves are formed, she was never known to roll seriously. In the Bay of Biscay, however, where she encountered waves which had a period of twelve seconds, she rolled dreadfully, to the surprise of all on board. Mr. Fronde believes that the degree of rolling in a ship is almost entirely independent of the sectional form of the hull.

THOSE PROPHETS OF OLD!—How rich the following paragraph appears, which was originally printed in the *English Quarterly Review* in March, 1825:—"We are not advocates for visionary projects that interfere with useful establishments. *We scout the idea of a railroad as impracticable!* * What can be more palpably absurd and ridiculous than the prospects held out of locomotives traveling *twice as fast* as stage coaches! We should as soon expect the people of Woolwich to suffer themselves to be fired off upon one of Congreve's ricochet rockets, as to put themselves at the mercy of such a machine, going at such a rate."

© 1860 SCIENTIFIC AMERICAN, INC.



BREAD.

MESSRS. EDITORS:—On page 52 of the present volume of the SCIENTIFIC AMERICAN, a correspondent (L. K.) has some judicious remarks upon the common methods of making bread; I therefore submit the following communication, trusting it may be deemed worthy of publication.

The term "bread" may be considered as a generic word, including in its signification biscuit, cakes and pastry. People of all countries, with few exceptions, prefer "raised," or light and porous bread, to the unleavened kind. Bread may be raised by three means: by the use of leaven, dough or yeast, in a state of fermentation; by the mechanical introduction of carbonic acid; and by the chemical liberation in the dough of carbonic acid from some substance with which is is combined. If the first method is properly conducted, it is quite unobjectionable; but if, as is often the case, fermentation is allowed to proceed too long, acetic and lactic acids are formed, and some of the complex nitrogenous substances arising from the decomposition of the plastic bodies of the flour. Saleratus or soda, to sweeten the sour sponge, is now the resort of the cook; and the result is an unpalatable and unwholesome loaf, unworthy the name of bread, much less of food. The second method is impracticable in the family, where the large amount of bread consumed is and must be made. The third plan is to introduce carbonic acid, in combination with soda, bi-carbonate of soda and an acid—such as tartaric—which, combining with the soda to produce a neutral salt, liberates the carbonic acid, and thus renders the bread light and porous. Instead of tartaric acid, cream-of-tartar (a bitartrate of potassa) is commonly used to decompose the soda, and the resulting compounds left in the bread are tartrate of soda and tartrate of potassa. Whatever may be said of the wholesomeness of these two bodies, they are, to say the least, quite as palatable and as desirable as the acetic, lactate or butyrate of soda or potash, which would be formed by the attempt to sweeten a sour sponge raised by the first method—by the use of soda or saleratus. But "cream-of-tartar and soda bread," as it is called, is dry and tasteless, especially when cold; so is fermented or leavened bread, unless the fermentation is arrested by baking at *just the right time*. Ordinarily, as is well known to those acquainted with the philosophy and practice of making good bread, this "*right time*" is a period of short duration, and I presume it is within the bounds of truth to declare that not one loaf in one hundred is raised and baked when it should be. The circumstances which modify the time in which the fermentation may take place are so varying that it may occur in thirty minutes or twelve hours. The sponge requires constant watching, and this, in the multitudinous duties of the kitchen, it is not always possible to secure. The difficulty of always securing good bread by this method is so great, among the masses, that dietetists and housekeepers have, for the most part, come to the conclusion that, could any substance be devised for combination with soda, in bread-making, that would be free from the objectionable features of cream-of-tartar and at the same time supply the desirable and essential clements of nutrition, a great benefaction would be conferred upon the human family. Such a discovery seems to have been made by Professor Horsford, and I think that if what your correspondent (L. K.) says of the want of "phosphates in the blood" and of "thin bones and rotten teeth," is not clearly shadowed forth in the following extracts from a circular of the professor, it is at least clearly shown that the article devised by him will supply what L. K. considers (and what is, in fact) so much needed:—

My attention was called, five years since, to the necessity of a substitute for cream-of-tartar, as an article of domestic consumption. It was represented to me by extensive dealers, that the production of cream-of-tartar was no longer equal to the demand, and that the greatly increased consumption in the arts and for culinary purposes, had caused its price to rise, until it seemed possible that for some important purposes its further use must be given up. It was also stated, that its high price had led to frequent adulterations, some of them of more than questionable character in their relations to health. Upon these representations, I undertook the solution of the problem as one of great public importance.

Among the essential qualities of a substitute for cream-of-tartar, in the preparations of all forms of light bread, cakes and pastry, are, that the article should be at least as unobjectionable as cream-of-tartar in its relations to the animal economy—that it should be pulverulent—and that when mixed with bicarbonate of soda and flour, it should, on the addition of moisture or application of heat, yield a neutral salt, and set free carbonic acid. If, in addition to these qualities, an article could be devised which should possess, in the form in which it is used, unquestionable excellence as an element of food, its value would be placed beyond doubt.

I tried in a great variety of ways, as numerous others have tried, without success, to find some form of muriatic acid which could be mixed with bicarbonate of soda, so as, after raising the dough or paste, common salt should be found in the product. To this most desirable end, insuperable difficulties presented themselves. I sought some form of harmless organic acid, suited to all the conditions of the problem, but this effort and many others were alike fruitless. At length it occurred to me, to find, if possible, an acid constituent present in all the cereals and healthful food, and place this in the necessary conditions to fulfill the wants of the problem—and at the same time, in such form, that when taken into the system, it would be suited to the agencies there in action, to be absorbed, if needed, or readily and healthfully remove if not required. Of all such constituents no one is so important as phosphoric acid. Physiological and chemical research have shown, that wherever in the body there is an organ of important functions, there nature has provided a store of phosphates. They are present in the juices, the tissues, the muscles, and in large measure in all the brain and nervous matter, and in larger measure still, in the bones. The grains we consume contain them. The flesh we eat contains them. The bones we boil and dissolve contain them. The French army was formerly supplied with rations of dissolved bone, prepared at high temperatures in Papin's digester, in the form of small cakes, which a little hot water resolved into soup. The bran which we withdraw from our wheat contains fourteen times as much phosphoric acid as the flour which we convert into bread. The natural provision in the animal economy for the removal of surplus phosphates, as in the waste and renewal of the bones, is well-known.

All these considerations led me to the conviction that, if it were possible to prepare phosphoric acid in some form of acid phosphate of lime, such that, after its action with moist carbonate of soda, it would leave phosphate of soda (a constituent of the blood) and phosphate of lime (an essential constituent of food), and confer upon it the necessary qualities of a dry, pulverulent acid, the end would be so far attained as to justify a practical experiment in domestic use.

I succeeded in producing the article in condition to meet the wants of the problem. I then introduced it into my family for use in all forms, as a substitute for cream-of-tartar for culinary purposes. When many months of daily use had assured me that my theoretical views were sustained by practical application, I gave it into the hands of friends, whose prolonged experience fully confirmed my own. It has been in constant use in my family now for more than four years; and in the form of yeast powder, during this time, it has been produced and consumed in all parts of the country to a very large extent, settling, in the most satisfactory manner, all questions as to its serviceability and healthfulness.

The article is prepared according to instructions furnished by myself, as the result of long-continued experiment, and it will be produced of invariable purity and strength equal to that of cream-of-tartar.

E. N. HORSFORD.

Of the same purport, and having a direct reference to this case, are the views of Dr. Samuel Jackson, professor of the institute of medicine in the University of Pennsylvania:—

Your substitute for cream-of-tartar for the raising of bread is a decided improvement. The tartaric acid is not a constituent of the grains from which flour is made; it is not a nutritive principle, and often disagrees with the alimentary organs. The phosphate of lime, which is the principal ingredient of your preparation, is an essential constituent of all grains. It is further an important nutritive principle; and recent experiments have proved it is an indispensable element in the construction, not of bones only, but of all the animal tissues. A deficiency of the phosphate of lime in food is a common cause of ill health, of defective development and retarded growth in children. In the conversion of wheat into flour, the phosphate of lime is rejected with the bran; and, in consequence, this necessary element of nutrition, contrary to the arrangement of nature, is not obtained from our fine wheat bread. Your preparation, while it makes a light, sweet and palatable bread, restores to it the phosphate of lime which has been separated from the flour, and thus adapts it as an aliment for the maintenance of a healthy state of the organization. SAMUEL JACKSON,

No. 224 South Eighth-street, Philadelphia.

Of a like import are the expressed opinions of chemists and physicians of acknowledged high character and standing, which might be continued at length.

If these facts were properly placed before the public, there would seem to be no longer any excuse for having bad and unwholesome bread. G. F. W.

MR. PRENTICE, of Mt. Hope, near Albany, N. Y., lost a number of cattle with *pleuro-pneumonia* in 1858.

CRITICISMS ON THE EXPERIMENTS WITH TURBINE WHEELS AT PHILADELPHIA.

MESSRS. EDITORS:—As conductors of a journal which is looked-to and depended upon as the index by which to ascertain what is useful and worthy of recommendation, and to detect what is questionable and of no value in actual practice, there is an importance attached to your pen and publications probably far exceeding the influence which *you* suppose yourselves to exercise by the course you pursue. As constant readers of the SCIENTIFIC AMERICAN, we are convinced of your steady aim to advance mechanical and scientific pursuits, to guide them in the right direction and to increase their usefulness; and we perceive that, in pursuing this object, you have not hesitated to censure so influential a body of scientific men as the Polytechnic Association of the American Institute. Therefore we feel certain that, if we can satisfactorily show that the public has been misled by printed reports, you will make such correction or mention of the subject as your judgment may dictate to be just and due to the public interest. We have reference to the several articles which appeared from time to time in your journal, in regard to the test of water wheels which has taken place at Fairmount Waterworks, near Philadelphia. Said articles (covering in all some five columns of your paper) are certain to appear to the unitiated as *perfectly reliable* and *impartially-reported* results of said experiments. Now, we aver that the results of the tests, as reported, *cannot* be relied upon, and that the report published on page 22 of the present volume of your journal, when viewed in connection with the facts, gives evidence of a want of practical science and a lack of impartiality, sufficient to exclude its introduction into any record of useful and correct experiment referred to, and depended upon by the public. We admit that we are forced into the position we occupy in this communication by the injustice done to the Littlepage wheel; aside of that, however, every one, engaged in a kindred pursuit, certainly feels a desire to see correct and just information spread abroad in a matter as important in a general view as this is. We also admit that we feel unable to pursue the subject without, in the proper place, making mention of said wheel. And the position we take, we are sure, will be supported and found correct by other testimony and future experiments.

In the first place, the public are led to believe that, to procure a power of 250 horses, with 8 feet of fall and the most economical wheels, requires a sum of from $23,000 to $29,000. The Stevenson wheel is presented to the public as giving-out—with a discharge of water of only 200 cubic feet per minute—nearly 91 per cent of useful effect. It was first tested in November last, and produced 73.36 per cent; a result which was then received with satisfaction, and no mention was made of a new trial or that anything was not operating as it ought. The reported test is dated March 9, 1860, and is given at 87.77 per cent; no mention is made how many intermediate tests took place. Three per cent is added, as a guess of the loss by friction of the apparatus and wheel. No mention is made of the fact that the Jonval wheels tested had proportionally very small steps, being built expressly for a short race, without regard to durability; whereas, a Jonval wheel built for *use* requires an enormously large step, which must necessarily reduce its effect considerably; the step of the Geyelin wheel at Fairmount, although very large, was perfectly *charred* by friction! In the Kalbach and Littlepage wheels, this difference in the steps of working wheels and *race* wheels does not exist, as the water comes into the wheels from below, and more than supports the weight of wheel and gearing.

The Parker wheel was tried in November, and gave out 58 per cent; and it is reported, under a test dated February 21, 1860, as the *Smith* wheel, with 75.69 per cent—a difference of 18 per cent. The report also shows that it had a test on a horizontal shaft, giving 67 per cent; making three separate tests known to us.

The Rich wheel is reported as giving out 61 per cent, under date of October 20, 1859; while in your paper (Vol. II., page 297) it is reported as giving out 74 per cent.

The Geyelin wheel was tested in November, and gave out 68 per cent; and it is reported, under a test dated February 29, 1860, as giving out 82 per cent.

© 1860 SCIENTIFIC AMERICAN, INC.

The difference made in the Rich wheel is 13 per cent; in the Geyelin, 14 per cent; and in the Stevenson, 14 per cent—a remarkable coincidence of increase of power in the last tests. In the Geyelin wheel, it is explained as the result of changing the wheel from a vertical into a horizontal position; but in the Stevenson and Rich wheels, no such change was made; and yet there is claimed the same increase of 13 and 14 per cent. In the Parker wheel, 8 per cent is claimed to be gained by the same change; still leaving 10 per cent unexplained.

No cause was shown why any of the wheels should have more than one test (meaning by "one test" a consecutive series of trials, selecting the best as the result), except in the tests of the Collins and Littlepage wheels. The Collins wheel gave out 50 per cent only in November; his packing, where the shaft passed out of the draft pipe, was imperfect; and the Littlepage wheel was locked in its solid, unyielding bearings and in the bevel gearing. Collins had a test reported, under date of February 9, 1860, with an increase of nearly 27 per cent. Littlepage was refused another test; while some of the other wheels, without showing cause for a new trial, had continued tests during the term of six months.

Of the Kalbach wheel, Mr. Birkenbine states:—"It is remarkable for its simplicity; and, had it been constructed with the same amount of care and finish as that of some of the others, it is believed that the co-efficient of useful effect would not have been surpassed by any." To this should be added that this wheel, as also the Littlepage wheel (as before remarked), has the advantage over the Jonval wheels of using the same step for a short *race*, as for common daily work; while the Jonval wheels require immense large steps to support the wheel, gearing and water. Mr. Kalbach was no doubt convinced that the Littlepage wheel surpassed his in simplicity and easy construction, though fully as durable; from the similarity of the wheels, he must have expected them to be similar in their capacities; he therefore proposed to Littlepage, reciprocally, to make common cause in the sale of the wheel, as proving which was the best of the two. The report states that a letter was addressed to Mr. Kalbach, as well as to the other parties named; but his proposal is not stated. He would no doubt have furnished the required power for a much smaller sum than those named—probably for one-half the amount. His wheel is rejected for the following reasons, which the public are expected to receive as sound, scientific and conclusive, as they ought to be from the chief-engineer and associates of one of the largest cities in the Union:—

1st. The report says:—"Our minimum head and fall is but 8 feet. To produce a power of 125-horses, by two wheels, would require each of them to be 50 inches in diameter, and *they would occupy so large a proportion of the head and fall that the co-efficient of useful results would of necessity be low.*" Such an assertion, coming from the source it does, is really astounding. We understand it to mean that the actual useful fall of 8 feet would be reduced by 50 inches, leaving a fall of nearly 4 feet; when, in fact, with the draft pipes used, if the wheels were *ten* feet high, the full fall of 8 feet would be utilized, just the same as if only 10 inches high—the difference, *if any*, is caused *not by a reduction of fall*, but by a different mechanical arrangement.

2d. It is asserted that a wheel upon a vertical shaft gives out a better per-centage than two wheels upon a horizontal shaft. There may be a difference, but it is a small one. At all events, the data furnished by Mr. Birkenbine cannot be recorded as the difference of useful effect of identically similar wheels in the two positions named. In the Parker wheel, the difference is given at 8 per cent; and with the Geyelin wheel at 14 per cent. This does not agree by 6 per cent; whereas, had the wheels not been otherwise changed, the amount of difference in the two ought to be very nearly proportional. At the same time, it is very remarkable that this additional 14 per cent here added to the Geyelin wheel, ostensibly caused by the said change from a vertical motion of the wheel into a horizontal one, has also been arrived at with the Stevenson wheel without any such change—to wit: 14 per cent difference between the first and last test. The same applies to the Rich wheel, which also acquired 13 per cent by the second test, without any change in the direction of the shaft.

3d. The last objection to the Kalbach wheel is that "the velocity would be so great, and the reduction of the speed, by means of gearing, to the speed of the pumps would therefore involve much greater loss by friction than could, in possibility, be the result of the plan adopted for the gearing of the Jonval wheel as proposed." Please to compare the last objection with the one of the reasons given for adopting the Geyelin wheel, to wit: "and, as regards the bevel gearing or reducing the velocity for the proper speed of the pumps by two or four wheels, there is only an *apparent additional loss by friction, but none in reality, as a little reflection will demonstrate!*" Gearing down to a less speed in the Geyelin wheel is declared to be *no* loss of power; while the same thing in the Kalbach wheel *is* declared a loss of power!

Mr. Birkenbine says:—"The department will adopt the Jonval turbine, arranged and geared similar to the one now in use at Fairmount."

We would suggest that, if the fly-wheel is placed on the shaft to which the crank of the pump is attached, as now in use, then the fly-wheel, if effectual, will require a weight of 200,000 lbs., with 44 feet circumference and 16 revolutions, for a power of 125 horses. Whereas, if the fly-wheel is placed on the shaft having the same velocity of the water wheel, to wit: 40 revolutions, then 32,000 lbs. will be as effectual as the 200,000 lbs. Had the two wheels upon a horizontal shaft been adopted with 80 revolutions, a fly-wheel of 8,000 lbs. upon the same shaft, or one of the same velocity, would be as effectual as the one of 200,000 lbs., as the latter is now applied; all having a circumference of 44 feet. The rule is to place the fly near the working point, when intended to accumulate force, as in this case. But rules have exceptions; and the more imperative rule ought to be adhered to in this case, to wit: a fly should always be made to move rapidly. This gives a difference, in favor of the horizontal shaft wheels, of 80 revolutions, in comparison with the Geyelin wheel, as arranged and now approved of at the Fairmount Waterworks; also, of 192,000 lbs. of metal saved in the fly-wheel, provided both be made to produce an equally smooth and even motion; and these 192,000 lbs., at 3 cents per lb., give the neat little sum of $5,760 in favor of the two wheels on a horizontal shaft. In addition, there would be no necessity for bevel gearing, nor for a step of which the surface is measured by the square foot, to sustain tuns of water. The bearings of the horizontal shaft wheels would only have to sustain the weight of the wheel *proper*, and they would be easy of access for lubrication.

LITTLEPAGE & CREUZBAUR.

Austin City, Texas, August 2, 1860.

REFORM IN WEIGHTS AND MEASURES.

MESSRS. EDITORS:—Having recently noticed that you were calling public attention to the propriety of using an extra degree of effort to bring the subject of a decimal system of weights and measures before the next Congress, and being much interested in that subject, I trust you will permit a British subject to offer a few remarks upon this very momentous question. I certainly must endorse your views as to the propriety and necessity of the measure; but may not a more comprehensive and direct course be adopted—a course that shall arouse attention not only in the United States of America, but in every civilized part of the world, or, at least, so far as the influence of American, English and French commerce extends? It may be asked, how can such a comprehensive measure be brought about? I reply that circumstances will sometimes transpire which will render the greatest difficulty apparently easy, and I consider this to be the case in the present instance. Now is the time, and the SCIENTIFIC AMERICAN is the instrument; and, in doing so, you will be accomplishing one of the greatest and most useful reforms of the age, not even excepting the Atlantic telegraph. I think this advocacy can be made a *paying* business, of itself, as it will undoubtedly extend the circulation of your very interesting journal. Being myself an Englishman, I candidly confess that, if the facilities which you possess existed in Canada, I should avail myself of that medium; but, as it does not, I deem it my duty, as a cosmopolitan, to communicate with you or any parties who will interest themselves in bringing about such a laudable measure. The time of action is the present season—the period of the visit of the Prince of Wales to this country.

The programme I suggest is as follows:—Let one number of the SCIENTIFIC AMERICAN be got-up in the best possible style, or in such a manner as will make it worthy of the subject and object; let its principal feature throughout be *union*; let its emblems be peace, commerce and literature; let the motto of this number be "Universality of Weights, Measures, Currency and Decimal-arithmetical Education for all Nations—or, at least, in France, Great Britain and the United States;" let those three great powers unite in the object, and become the theater of enterprise for the remainder of the world (for whatever they agree upon would be followed by the other nations, not only as a matter of choice, but of necessity); let there be a suitable (short) preface to the subject; let an address follow, proving the disadvantages of the present system and the advantages of the new one; let *fac-simile* representations be made of the several necessary silver coins, from a five-cent piece to a dollar—say 3, 5, 10, 20, 50 and 100-cent pieces. A page or two (or even more, if necessary), may be devoted to silver coins. The face side to contain the suitable insignia, with its proper mottoes, which can easily be obtained from any of the "coin manuals" of the day, with any improvement which may suggest itself; the reverse side, in all cases, to bear the value universally applied, as 3 cents, 5 cents and 10 cents, &c. Preceding this, however, should be printed a table of the values of various coins, unless it should be deemed expedient to put all the tables together; in either case, I recommend the American terms to be used, as now understood. Silver coins may be distinguished from gold by the face side having the *bare* head, as in the Canada silver coins of 1858. Gold coins of monarchies to be represented (as usual) by a crown or eagle. Most of the characters and inscriptions can be copied from a coin manual, or arranged in a somewhat similar manner. I apprehend that the circulating medium of the world, or all that is actually necessary, could be thus represented. The reverse sides of the coins of every nation would agree in the denomination according to the value of each coin, but the face sides would differ according to the latest insignia represented on their coins; pretty and interesting pictures would be thus produced, independent of utility.

Other pages may contain tables of weights. This may be rendered very simple, especially if we use French terms for weights; and I prefer those for two reasons. One is, we have chosen the American terms for money; let us therefore, out of courtesy, take the French terms for weight. Now, as we have but one standard of weights, we can reduce them to the lowest possible fractisn, say a pound avoirdupois shall be the unit reduced to, or rather composed of, 10,000 parts; while terms of the smallest parts are in beautiful unison with the object they represent; hence, we should say 10 atoms make 1 Partical (French *particule*); 10 Particals, 1 Grain; 10 Grains, 1 Ounce; 10 Ounces, 1 Pound or 1 Livre (French); 10 Livres, 1 Stone; 10 Stones, 1 Quintal; 10 Quintals, 1 tun of 1,000 lbs. avoirdupois.

Of measures, there are some excellent delineations in the United States, which only want to be properly matured. For lineal measure, I would simply recommend a *commercial* Foot; this should govern cords, yards and fathoms, and be determined on by a committee or congress of nations, who should settle what species of measures should be adopted; but I may suggest, as a rule, say 10 Lines make 1 Mark; 10 Marks, 1 Inch; 10 Inches, 1 Foot; 10 Feet, 1 Rod, &c.

Let the opinions of the several Boards of Trade be previously obtained: and, if favorable, insert them in the "presentation copies" of the SCIENTIFIC AMERICAN; get (it possible) the co-operation of consuls and plenipotentiaries: and then, when your arrangements are all completed, present a splendid copy to the Prince of Wales when he visits your city; having first secured a patent or copyright for publishing it in the United States, France and Great Britain; and first sending a suitable number of magnificent copies to the Emperor of the French, the Queen of England, the President of the United States, the Governor-general of Canada, and such others as you may think would further the end in view. I am inclined to believe that if the price was not too high, there would be a greater demand for this one

© 1860 SCIENTIFIC AMERICAN, INC.

number of the SCIENTIFIC AMERICAN than for a single number of any other periodical ever before printed in any language. RICHARD LEWIS.

Melbourne, C. E., August 15, 1860.

[We should be very much pleased to see the two nations unite in the great reform above-advocated by our correspondent; but we are opposed to this country waiting any longer for England. It is the effort to get up a great "world-combination" that has caused the measure to be delayed for the last 70 years, and which threatens to delay it forever. We do not believe that a better system than that of France will ever be devised; and that has the powerful recommendation of being already in operation by one of the leading nations. We therefore think it best for the people, both of England and the United States, to urge the adoption of the measure upon their respective governments as soon as possible, without waiting for each other. Already, one part of the system will have to be omitted here—the measure of land. Our government land-surveys have become so extensive that they had better be finished on the same plan. But all the rest of the French system of weights and measures may be adopted at once, and the sooner the better. When we get the beautiful, simple and convenient decimal system in operation, we shall wonder how we could have so long retained the present clumsy, complicated and barbarous method. Let some patriotic or ambitious member of Congress prepare a simple bill requiring that the French system of weights and measures, as at present in use, shall be adopted in our custom-houses and in all government transactions; and the great work will be done.—EDS.

INVENTIONS WANTED IN TEXAS.

MESSRS. EDITORS:—The great want of Texas is sufficient water. The only means of obtaining it in this section of the State is by making cisterns and by boring wells with an auger. The bored wells are about 5 inches in diameter and from 100 to 300 feet deep. The water rises in the well to from 50 to 80 feet of the surface. To draw the water we use a tin tube, 5 or 6 feet long, with a valve in the lower end. Now these tubes are easily broken and frequently leak, and this leaking from the bucket keeps the water muddy. I wish to know if you cannot suggest some better method of raising the water. Are there any pumps, simple and durable, that will pump the water from a depth of 100 feet? What we want is a pump that is simple and will not get out of fix; for we have no shops to take them to if they need repairs. The price of boring these wells is 40 cents per foot for the first 100 feet, and 75 cents for the next 100 feet, and so on. So, if any of your readers have an improved apparatus for boring, they might do well with it here. And you may tell your inventors that this is the field for their steam plows and windmills. There is a million of dollars lying waiting here for the first man who will bring us a steam plow that will turn over our prairies cheaper than our oxen; and another million to the man who can furnish us with a windmill, strong, durable and controllable, that will do our grinding and threshing cheaper than steam. I know there are many professing to do this, but give us one that will stand the test of actual experiment.

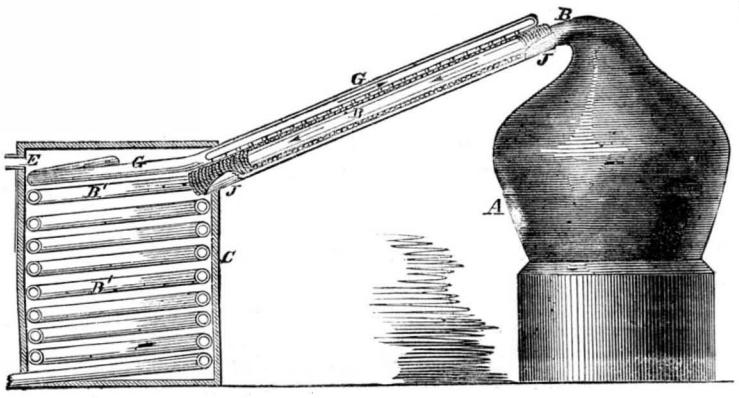
I have been taking your paper for ten years; its chief excellence, in my opinion, is its perfect *reliability* and the total absence of *clap-trap* and *humbug*. I do not believe that you can be bribed to say of somebody's fly-trap that it will catch more flies and bigger flies than anybody else's fly-trap. A. H. S.

Springfield, Texas, Aug. 7, 1860.

LUM'S POWER-ACCUMULATING WINDMILL.—We would respectfully inform *Le Génie Industriel* that its description of Lum's "Power-accumulating Windmill" betrays, on the part of the translator, an entire misapprehension of the nature of the invention. The machinery is driven by just the force of the weight, neither more nor less, as well when the weight is ascending as when it is descending.

IMPROVED CONDENSER.

The invention which we here illustrate is designed to take advantage of the great power of evaporation in condensing vapors in distillation. It is well known that it takes about 1,000 degrees of heat to evaporate water; that is to say, 1,000 degrees of heat passed into water will convert it into vapor of the same temperature as the water. If a hot liquid is used for evaporating the water, these 1,000 degrees of heat are extracted from the liquid, which is consequently very rapidly cooled. In the ordinary still, the vapor is condensed by winding the pipe which conducts it from the boiler spirally in a tub through which a constant flow of cold water is maintained. The improvement represented in the annexed cut consists in covering that portion of the pipe which leads from the boiler to the worm with cloth or other soft substance, and keeping the cloth constantly wet with cold water, which, by its evaporation, cools the contained vapor.



BROWN'S IMPROVED CONDENSER.

A represents the boiler and B the conducting pipe, which is wound with yarn throughout its whole length. The feed pipe, G, which supplies the cold water to the worm-tub is laid directly over the pipe, B, and is perforated with numerous small holes through which the water escapes upon the yarn or cloth covering the pipe, B. The surplus water escapes from the end of the pipe, G, and is caught by the trough, J, and conducted to the worm-tub, C, being the only source of supply to the tub. A waste pipe, E, carries off the excess of water and prevents the tub from overflowing. The pipe, G, after it enters the worm-tub, is carried once around or partly around the tub, and the supply of water is either forced through it with a pump, or drawn from a reservoir at a greater altitude.

The inventor of this improvement is Abram C. Brown, to whom the patent was granted, through the Scientific American Patent Agency, on the 10th of July, 1860. Further information in relation to this invention may be had by addressing Abram C. Brown, at the corner of Eighth-street and Buttonwood, Philadelphia, Pa., or his agent, Charles Bradfield, at No. 16 Exchange-place, Jersey City, N. J.

THE POWER OF THE HEART.—Let any one, while sitting down, place the left leg over the knee of the right one, and permit it to hang freely, abandoning all muscular control over it. Speedily it may be observed to sway forward and back through a limited space at regular intervals. Counting the number of these motions for any given time, they will be found to agree exactly with the beatings of the pulse. Every one knows that, at a fire, when the water from the engine is forced through bent hose, the tendency is to straighten the hose; and if the bend be a sharp one, considerable force is necessary to overcome the tendency. Just so it is in the case of the human body. The arteries are but a system of hose through which the blood is forced by the heart. When the leg is bent, all the arteries within it are bent too, and every time the heart contracts, the blood rushing through the arteries tends to straighten them; and it is the effort which produces the motion of the leg alluded to. Without such ocular demonstration, it is difficult to conceive the power exerted by that exquisite mechanism, the normol pulsations of which are never perceived by him whose very life they are.—*Jos. W. Sprague.*

THE trotting stallion "George M. Patchen" has been bought by Mr. Waltermire, of this city, for $25,000.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

Variable Stars.—Professor Gould read a paper on this topic. He stated that careful observations had revealed the fact that the number of variable stars is now about eighty. Scientific men in this country and Europe had turned their attention to this subject, and important results might be expected. The generally received opinion is, that every star under the third magaitude is variable. He mentioned a number of the variable stars; one of them had a few years ago apparently disappeared altogether, but about a year ago it re-appeared suddenly, with more effulgence than ever.

Roosevelt's Paradoxes.—Mr. Clinton Roosevelt, of New York, presented a paper on the Paradoxes of the Atomic Theory of Chemistry. He said that we rely much on common-sense, but there is only one thing on which all sentient beings have agreed, and that is that happiness is the chief good of existence. From this point all sects and parties separate and come in collision, so that in philosophy, as well as in religion, and morals, and politics, it was necessary to determine the higher law, as well as the rule of faith in evidence. He considered that all matter is ethereal, and that all atoms are evolved from *something*, and this certainly established the higher physical law. He proposed to set up a new system of chemistry and upset all established notions generally. This paper, from its great profundity, drew forth the *silent* applause of the whole association.

Spontaneous Combustion.—Professor Horsford read a paper on the burning of Berdan's Mechanical Bakery, in Boston, supposed to be the work of an incendiary, but which he showed might have resulted from spontaneous combustion in the boxes of sawdust used to catch the drippings of the oil. It is well-known that some oils, when spread over a surface, and exposed to air, absorb oxygen with such great rapidity as to heat considerably and to ignite if there is small opportunity of cooling. The sawdust absorbs the surplus oil, and where remaining in piles, spontaneously takes fire. Professor Horsford described an apparatus for testing the comparative avidity with which different oils absorb oxygen, or, in other words, there safety. It exposes equal surfaces of the oils to the action of the air, and measures the quantity of oxygen absorbed by each, all being compared with pure sperm oil, which is known to be safe.

Lighting Mines with Gas.—To prevent fire-damp explosions in collieries, by lighting with coal gas, was the subject of a paper by Capt. E. B. Hunt. He proposes to avert the dangers of coal mines by lighting them with coal gas, supplied with air from the surface, not allowing the atmosphere of the mine to come in contact with the same.

Professor Rogers thought the plan would be impracticable, from the fact that the progress of the work required that the workmen should be supplied with a movable lamp. It was certainly a great desideratum that some means should be devised to prevent the frequent casualities in our coal mines.

The Oil Wells.—Professor Newberry read a paper on this subject. The oil is found in Pennsylvania, western Virginia, Ohio, New York, Canada and other places. The wells yield, by pumping, from ten to twenty-five barrels per day of the crude oil. The yield of the refined article of the Pennsylvania oil is about 85 per cent of the whole. He saw a well which gave ten barrels a day of pure oil, and it was barreled and sent to market as it came out of the ground. The owner was not satisfied and deepened his well, and in eighteen hours 110 barrels were collected from it—but this proved to be very impure. The crude oil burns dimly, and is a very good lubricator, and when refined has less smoke and less odor than any other oil, and is not explosive, while its illuminating power is equal to the best coal oil.

In Illinois the oils occur in a limestone, and the loss by distillation is about one half. These oils everywhere occur, for the most part, about one geological level. The oil seems to have distilled from the carbonaceous deposit below, and it may be the product of animal as well as vegetable remains.

Professor Pugh confirmed the statement as to the practical value of the petroleum; it is used with great success by the students in the institution to which he

© 1860 SCIENTIFIC AMERICAN, INC.

belongs, and they find it to burn better and to be generally superior to the common oil.

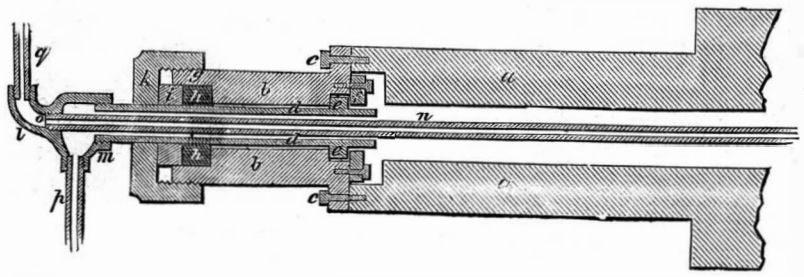
Professor Whitney thought it likely that these oils were of animal origin, as no vegetable had been discov- in the Hudson river formation, from which also oils had been obtained.

Remarkable Spring.—Professor John Le Conte read a paper on the phenomena of the Silver Spring, in Marion county, Florida. This spring rises in a basin 30 feet deep, and pours out a stream large enough for steamers to ascend. Other basins along the stream showed nearly the same depth to the limestone crevices from which new springs boiled up. The marvelous property of the spring is the transparency of the water. It seemed on looking down, as though the plumb bob could be seen just as distinctly under 36 feet of water as it could be through as many feet of air. Experiments on reading cards fastened to bricks, proved that printing could be read at as great a distance under the water as in the air. The vertical depth of the water seems to the eye very much exaggerated, especially under the boat, so that without measurement, the bottom appears continually to recede under you as you float, and to appear under your boat about 50 feet deep, and to rise around on every side. The spring is very steadfast in its flow, and receives no surface water.

Gold of Georgia.—Mr. Wm. P. Blake read a paper on the "Distribution of Gold in Veins," and illustrated it by some beautiful specimens of gold from the Field's Gold Vein iu the bed of the Chestatee river, Georgia. From this vein $10,000 worth of gold was taken out of a pit ten feet deep, and one bushel of the rock yielded 3,000 pennyweights. He also exhibited some very large nuggets of gold from the mines of the Nacoochee Hydraulic Company, weighing respectively 387, 115, and 59 pennyweights, comparing favorably with the nuggets of California and Australia in size and richness. The 387 pennyweight mass is the largest yet found in Georgia. These and a much larger weight of smaller masses were washed out by the hydraulic process from the top of a ridge above the river; they being in what the miners call a hill deposit.

Zoological Museums.—Professor Agassiz spoke on the arrangement of the Zoological Museum at Cambridge. He said that this subject seemed hardly worthy the attention of a society like this, and yet museums were a condition of the progress of the learning and art in every country, and their arrangement expressed the progress made. He had, therefore, thought it worthy of presentatation. He had felt in this arrangement that every progress made in his devices coincided with the progress he made in his insight of his own subjects of inquiry. Professor Agassiz recounted the steps by which $225,000 had been secured for the foundation of a Museum of Comparative Zoology in Cambridge. Upon this basis he had drawn a plan capable of indefinite extension—a plan which, if carried out, would be inferior to none in the world. The structure already erected would be only one-tenth large enough to cover this. He had made it include zoological life in all its periods. A plan was required which would not require remodeling as it grew.

The Labrador Expedition.—The Great Eclipse.—Professor Stephen Alexander, of Princeton, chief of the Labrador expedition, returned with his party in the United States schooner *Bibb*, just in time to give the scientific association an account of the voyage and observations of the eclipse, in substance as follows:—"You are well aware that the observations of the total eclipse of 1860, at a point near the coast of Labrador, was undertaken under the patronage of the coast survey. I was the humble agent of carrying out the ideas of the superintendent—that is my associates and myself; for though the expedition had an ostensible head, that did not imply superiority on the part of any. We were to place ourselves as near as possible to the line of the central eclipse; and this morning I am to state to you as briefly as possible how we selected our station, and what we saw when we got there. Never in my wildest dreams have I seen such scenes of grandeur as we saw when nearing our destination. For the last fifty miles an anbroken chain of mountains seemingly formed of cast iron, rose beyond the limits of arborescent vegetation, patches of snow still lingering on their eastern side. We penetrated a little inlet, and found, after a while, a set of terraces, upon which we finally placed ourselves. When the day of the eclipse arrived, a great part of the heavens was overcast, and yet much that was interesting and a great deal that was valuable, were all gathered. We had arranged ourselves and distributed our labors; we discussed every method, we ascertained who should take this and who should take that. We were ranged together so as to communicate easily with all, the photographer at my side. We waited until the critical time; nobody spoke until everything had been observed. When I was perfectly sure of the minute of contact, I called for it; then the photographer let fly the spring of his instrument, and caught the little curve, and showed the ragged edge of the moon in his picture. Another phenomenon is a belt of light, which appears outside of the moon on the sun, showing that the rest of the sun is certainly brighter along by the edge of the moon. We studied that with different colored glasses, some colors showing it more strongly than others, and as usual, the faithful photographer caught it. And another curious phenomenon was seen by only one of our party. On this side of the moon close to the edge of the sun was a bluish light. The eye saw it, was satisfied it was there, reported it specially, and then we opened the photographic plate, and then that phenomenon, supposed to be an optical illusion, the photograph remembered it and put it down. As the eclipse advanced, nothing could be more beautiful, just because the clouds were there, and we did not need a screen glass. And through that little film of cloud the beautiful and lessening crescent could be looked at by the bare eye; and as it narrowed and narrowed, it became a bit of ragged silver wire. Those who looked without the dark glass saw the ragged edge, and it seemed to them that the glorious luminary was sinking away until it was lost; it looked like some intensely brilliant incandescent metal, exposed to intense heat, and dropping away until it was gone. Then, what would we have given for no clouds! But then was the most cloudy season of all; nine-tenths of the sky was covered. Just before that gloomy twilight came, one of the officers of the ship, whose part in the division it was to watch if he could see the shadow, looked around on the savage mountain, and on came the great black shadow, like some fearful cloud. He saw it approach. Three minutes passed, and he saw it fly. When the shadow come over us, oh! what a beautiful display of colors we had! Just as the eclipse was fairly total, our Canadian friend, Lieutenant Ashe, caught a view of the long, white blade of light, quivering through where the the sun had gone out, and he caught the first blush of that corona, which we would have given much to have seen throughout. But just because it was cloudy, perhaps that observation is valuable. It may be well for science that the shade was there. But we did not lose the corona quite; for I arranged through the assistance of Mr. Venable, some things to be looked after by the seamen themselves. They were instructed what to look for, and I received from an intelligent quartermaster whom I closely cross-questioned afterward, a distinct account of how he and some sailors saw the corona along the black moon, and how it looked, and how it trembled, These are among the more interesting phenomena that we saw."



CAMPBELL'S PATENT STUFFING-BOX.

THE LAST OF THE ATLANTIC CABLE.

The fate of the 2,000 miles of cable which were laid between Newfoundland and Ireland is decided. Capt. Kell and Mr. Varley, who went out from England to endeavor to raise the American end of it, report that, "although they have, on many occasions, been able to raise the bight, and so get on board at different times pieces of cable, in all amounting to about 7 miles, they have invariably found it broken again a few miles off." Attempts were made at various points, but all were unsuccessful; the rope, in almost every instance, giving way. It was, therefore, found necessary to abandon it. The outside iron wires were almost entirely destroyed with rust. The gutta-percha and copper wire are, however, in as good condition as when laid down. Those portions of the cable recovered at Break Heart Point, that were wrapped with tarred yarn, were sound; the tar and hemp having preserved the iron wires bright and free from rust.

IMPROVED STUFFING-BOX.

In the manufacture of paper, india-rubber, &c., hot iron rolls are required, and it is the usual practice to make them hollow, and heat them by passing steam into them through the axle. This, of course, makes it necessary to pack the journal-box steam tight, and the invention which we here illustrate is an improved plan of stuffing-box for effecting this packing.

a represents the end of the (journal of the) roller to be heated while it is revolving in its bearings; *b* is the stuffing-box, which is fastened steam tight on the end of the roll, *a*, in any suitable manner, so as to revolve with it; in this instance the stuffing-box is bolted to the end of the roll, *a*, at *c* and *c*; *d* is a piece of ordinary steam pipe, or tube, which is turned off in a lathe, so as to be round and smooth. At *e* is represented a collar firmly fastened on this piece of steam pipe, by shrinking it on at a white heat. This collar, *e*, is likewise turned off, round and smooth. A recess is made in the stuffing-box, *b*, in which the collar, *e*, fits, so as to permit the roll, *a*, freely to revolve around it. The flange or ring, *f*, is bolted on the end of the stuffing-box, *b*, as shown, and forms, with the recess in said stuffing-box, a chamber to enclose the collar, *e*. The collar, *e*, serves to prevent end motion of pipe, *d*, since the latter is confined by means of ring, *f*, against the collar, *e*. The ring, *f*, is received in a recess provided for it in the end of roll, *a*. At the front end of stuffiing-box, *b*, is a chamber, *g*, to receive the packing, *h*, and metal follower, *i*. The nut, or thimble, *k*, screws upon the end of the stuffing-box, *b*, and serves to compress the packing, *h*, against the bottom of chamber, *g*, thus expanding the packing, so as to make a steam-tight joint with the inside of said chamber and the outside of pipe, *d*; *l* is an elbow into which the pipe, *d*, is screwed at *m*. This elbow has likewise a pipe, *n*, screwed into its inner side at *o*, which is of small diameter, and passes loosely through the pipe, *d*, into the hollow portions of the roll, *a*, in such a manner as to leave a clear space through which the water of condensation can escape through the discharge pipe, *p*. Inserted in the elbow, *l*, is also the pipe, *g*, through which the steam is led from the boiler. The pipes, *p* and *g*, being rigidly connected with the pipes in the building, the pipe *d*, is prevented from revolving with the roll, *a*. The revolving roll, *a*, can be cooled as well as heated by this arrangement, by simply introducing cold water instead of steam.

The inventor says:—"Heretofore all stuffing-boxes applied to the rollers used in the manufacture of gutta-percha, paper, &c., in which steam or cold water is introduced while the rolls revolve, were of much larger diameter on the friction surface than my pipe, *d*, while the packing employed with such stuffing-boxes had a much more extended surface subjected to friction. Besides this saving of friction, my stuffing-box has also the advantage of cheapness, compared with those heretofore used."

The patent for this invention was granted June 12, 1860, and further information in relation to it may be obtained by addressing the inventor, Hugh Campbell, at Newtown, Conn.

AT the depth of 2,480 yards water will boil; lead melts at the depth of 8,400 yards. There is red heat at the depth of seven miles; and if we adopt the temperatures as calculated from Morveau's corrected scale of Wedgwood's pyrometer, we find that the earth is fluid at the depth of 100 miles.

© 1860 SCIENTIFIC AMERICAN, INC.

JOURNAL OF PATENT LAW.

THE SALE OF INVENTIONS—THE INCHOATE RIGHTS OF INVENTORS TO EXTENSIONS OF THEIR PATENTS.

The rights of inventors to the uses and profits of the subject of their inventions, and the rights of patentees under valid Letters Patent, whatever they may be, are the result of a superior civilization, and owe their existence to the demands of the age, as well as to the more perfect moral sensibility of this era. The enactments of Congress by which these rights are secured are founded both upon sound policy and upon an abstract perception of the natural right of the inventor to the thing invented. And although reasons of expediency or state policy may, in the first instance, have been the sole moving cause of the passage of our patent laws by the general government, yet, now, no intelligent man would ascribe our present patent system to so poor a motive; but he would rather claim for it a foundation built upon the rocks of ever-enduring justice and right.

By the light of both of the above-stated principles, judicial decisions must interpret the statute laws, as well as write the future common law of patents. The comparatively short space of time in which the rights of inventors, and the analagous rights of authors to the exclusive sale of their books, have been acknowledged, leaves, of course, a vast amount of improvement to be learned from experience, and yet to be applied before our system is perfect. Gradually, the rights of inventors will become better defined, especially as their contributions to the wealth of society increases, and as the importance of interests involved brings cases involving their rights before the courts. Thus, in the case of Clum *vs.* Brewer, we have it declared that the inchoate right of an inventor to the exclusive privileges under an extension of Letters Patent is the subject of a sale, by the inventor, if he so choses to part with it; and although an invention does not necessarily carry this inchoate right, such a sale may be inferred from the instrument, evidencing the sale of the invention.

The above-cited case arose under Samuel F. B. Morse's patent "system of electro-magnetic telegraphs for the conveyance of intelligence by words and signs, or by either;" and the question to be decided by the court was whether the contract of sale to the defendant, conveying "one undivided fourth part of the invention prior to the securing of Letters Patent," also conveyed the same proportion of interest in the exclusive privileges accruing from an extension of the patent beyond the original term of fourteen years. This involved the question as to whether the inchoate right of the inventor to an extension of the term could be the subject of a sale; and if this was answered in the affirmative, the further question as to whether, from the terms of the contract, this was the intention of the parties.

Upon this question, Justice Curtis, who delivered the opinion of the Circuit Court, said:—"I have looked into the documents on which the title of the respondents depends, and will now state my opinion thereon. The defendants claim under Francis O. J. Smith, whose title was originally granted to him by Morse, by a deed dated in March, 1838. At the date of the deed no Letters Patent had been obtained. The deed could not convey, and does not purport to convey, an interest in any particular Letters Patent. It purports to convey 'one undivided fourth part of the invention.' As is said in the Supreme Court, in Gayler *vs.* Wilder, 'the discoverer of a new and useful improvement is vested by law with an inchoate right to its exclusive use, which he may perfect and make absolute by proceeding in the manner which the law requires.' It was one quarter part of the inchoate right which the deed undertook to convey. But the inventor has not only an inchoate right to obtain Letters Patent securing to him the exclusive right to his invention for the term of fourteen years, but also a further inchoate right to have the term extended, provided he shall fail, without fault, to obtain a reasonable remuneration, for the time, ingenuity, and expense bestowed upon the same, and the introduction thereof into public use. Though it has not been expressly determined that the last right is the subject of a contract of sale, I conceive there can be no reasonable doubt that it is so. The reasoning of the court, in Wilson *vs.* Rousseau, assumes, and, indeed, asserts, that it is so. And there is nothing in the nature or incidents of such a right to distinguish it as a subject of sale from the inchoate right to obtain an original patent. Each appertains to the inventor by reason of his invention. Each is complete, and its completion depends upon the compliance by the inventor with conditions and the performance by public officers of certain acts prescribed by law. It is true, the title of an inventor to an extension is still further qualified by a further condition, of his failure to obtain remuneration from the enjoyment of the exclusive right for the first term of fourteen years. But though this is an additional condition, which may render parties less willing to contract, its existence does not change the nature of the right, and it no more prevents it from being the subject of a contract of sale than any other condition which is attached to it. Considering, then, that the title of an inventor to obtain an extension may be the subject of a contract of sale, the inquiry in this case is whether part of it was intended to be sold. I am inclined to the opinion that a sale of the invention before Letters Patent are obtained, does not necessarily carry with it the exclusive right for the extended term. Because this right is not a mere incident of the invention. Its existence is made to depend, not only on matter which is subsequent to the invention, but exclusively personal to the inventor himself, and only he or his personal representatives can obtain it. But at the same time it must be admitted that where an inventor has in terms sold to another person a part of his invention, he has done that which is quite consistent with an intent to have that other person participate in all the rights which he, as inventor, can acquire by law: and that where the invention is the subject sold, it would be natural to expect to find in the instrument of sale something showing an intention that the purchaser should be interested, not merely in the original Letters Patent, but in any extension thereof securing the exclusive right to the same invention which was the subject of the sale."

The judge here went into an extended argument to show that the deed from Morse to Smith conveyed on its face an intention to pass this inchoate right to an extended patent if any should be issued; but we have already quoted enough to illustrate the points of law upon which we started, and to show how, in the progress of time, the rights of the inventor are becoming better understood and more firmly established.

THE FRESNEL LIGHT.

Though this light was described and illustrated several years ago in the SCIENTIFIC AMERICAN, we give place to the following communication, as interest in the subject has again revived:—

MESSRS. EDITORS:—An article going the rounds of the papers, and descriptive of the progress of the government works on Minot's Ledge, where it is in contemplation to place a "Fresnel Light," of the first order, has suggested the seasonableness of presenting to the readers of the SCIENTIFIC AMERICAN a brief exposition of the principles and operation that triumph of French science and art.

Suppose an ordinary lamp, without any contrivances to increase and diffuse its light, to be placed on a tower overlooking the sea. When this is lighted, part of the rays fall on the ground beneath it and are lost; part go forth in an upward direction and are of no use; part diverge toward the land and do not subserve the purpose of guiding the mariner; a small part only goes forth over the sea, and even this by constantly diverging becomes continually more feeble and scattered, so that at a short distance, but very few rays of light enter so small a space as the sailor's eye. To remedy this, let such a lamp be placed in the focus of a parabolic concave reflector, and, by a property of the parabola, every ray which falls on the parabolic surface is reflected in a direction parallel to that of every other reflected ray. Thus a great portion of the rays are not lost by being scattered upwards, downwards and towards the land, but are collected into a cylinder of light parallel to the axis of the mirror, and capable of being transmitted to the greatest distances with the same brightness, except that a small portion of the light is absorbed by the vapors of the atmosphere. But this construction is not without its disadvantages; for the cylinder of reflected light can have no greater breadth than that of the mirror, and, of course, is not visible at any considerable distance, unless turned exactly towards the eye. A familiar example of this principle is afforded in the experience of every one who has watched the approach at night of a locomotive carrying one of these parabolic lanterns. Directly in front of the engine the brilliancy rivals that of the sun. But to one standing at the side of the track the light appears quite like that of an ordinary lantern. To remedy this defect, several of these reflectors, each containing a lamp in their focus, were arranged in a circle. But even then there were many spaces left totally dark. Finally a regular rotary movement was given to one lamp and reflector, and in this way its light was sent forth at intervals. Such an alternate appearance and disappearance of the light was found to be a great convenience to the sailor, by enabling him to distinguish the beacon light from a star near the horizon, or a bonfire built on the shore.

On the above-stated principles a great majority of the lighthouses throughout the world were constructed, until the invention of the "Fresnel Light." This light—the joint product of the genius of Fresnel and Arago—was devised to furnish a remedy of one serious defect in the system of lighting by parabolic reflectors, viz., the absorption of so large a quantity of light by *the mirrors themselves.* It occurred to those eminent *savans* that glass lenses might advantageously be substituted for reflectors. It was discovered, however, in practice, that it was impossible to cast lenses sufficiently large, without containing numerous *striae* and irregular veins, which seriously impaired their value. Fresnel undertook the task of solving the problem thus presented of manufacturing a lens sufficiently large and perfectly clear. The desired result was accomplished, by casting a peculiarly shaped lens, called the the *Lentille à êchelons*, or the lens by steps. On the one side it presents the appearance of an ordinary lens, but on the other side is scooped out and cut away in successive layers of steps. By this device the refractive property of the lens is preserved without making it so thick.

In addition to the above invention, Fresnel (in conjunction with Arago) constructed a new lamp to be used with the new lens. It is well known, that the superiority of the Argand over all other lamps is owing to the introduction of a current of air containing fresh supplies of oxygen to the interior of a circular wick. It occurred to the academicians, that a lamp constructed with several concentric wicks would impart a proportionable increase of brilliancy. And so the event demonstrated. The brilliancy of their lamp was 25 times that of the best lamps with only a double current. This lamp, here described, transmits, through the Fresnel lens, a light equivalent to that of *four thousand Argand lamps united*, or eight times the light sent forth from a silvered parabolic reflector. The first of these was erected in 1823, on the coast of France. They are now fast superseding ordinary reflectors

E. L. P.

Norwich, Conn., August 16, 1860.

A NEW COLD SOLDER.—The Paris correspondent of the London *Photographic News* says that M. Gershein has formed a useful alloy of copper, which resembles somewhat the amalgam of copper produced in 1848 by M. Pettenkofer, of Munich. Pure copper is first obtained by reducing oxyd of copper by hydrogen, or precipitating the metal from some of its salts by zinc filings; 20, 30, or 36 parts of this pure copper are taken (according to the degree of hardness desirable); they are moistened well, in an iron or porcelain mortar, with concentrated sulphuric acid, of 1.85 specific gravity, and to the paste thus obtained are added 70 parts, by weight, of mercury; the whole is well stirred. When the copper is perfectly amalgamated with the mercury, the compound is washed with boiling water to dissolve all the sulphuric oxyd; and, after cooling, the amalgam becomes, in eight or ten hours, hard enough to scratch tin and gold. This amalgam is not attacked by weak acids or by alcohol, ether, &c. It adheres firmly to all substances, whether they may be metallic compounds or surfaces of glass or porcelain, and can be employed as a mastic or cement to join metals, &c. To this effect, it is rendered soft and pliable by heating to 375° (centigrade), then heating it in a mortar heated to 125° (centigrade), until it has taken the plasticity and consistency of wax. The peculiar properties of this amalgam make it very useful for a variety of purposes, especially for soldering metals where heat cannot be employed.

© 1860 SCIENTIFIC AMERICAN, INC.

TALK WITH THE BOYS.

No. 2.—WHAT BECOMES OF GAS WHEN IT IS BURNED?

"Now, father, we want to know what becomes of the atoms that gas is composed of when the gas is burned."

"In order to explain that to you clearly, I must have some balls to represent atoms of oxygen. These must be made of some substance considerably heavier than the balls which we use for carbon, as the atoms of oxygen are a little more than eight times heavier than atoms of hydrogen, and are only half as large. Perhaps some very heavy wood will answer the purpose. Now, to illustrate what takes place when gas is burned, we will cut asunder one of the atoms of light carbureted hydrogen, which gives us, you see, two atoms of hydrogen and one of carbon. We next fasten, with the thread, one of the atoms of hydrogen to one atom of oxygen, and we have an atom of water (HO). Serve the other atom of hydrogen in the same way, and we have two atoms of water. Then unite the atom of carbon with two atoms of oxygen, and we have an atom of carbonic acid gas (CO^2). The oxygen comes from the air, of which it constitutes about one-quarter. The olefiant gas, in burning, is decomposed in the same way; its hydrogen and carbon combining with the oxygen of the air, and producing, also, water and carbonic acid. I do not care to confuse your minds by carrying you through these changes, but if you choose to go through them, you will find that the burning of one pound of illuminating gas takes up four pounds of oxygen, and produces about two pounds of water and three of carbonic acid."

"But, father, I do not see any water or carbonic acid about the burner. Where do they go to?"

"They become invisible, and float away in the atmosphere."

"What makes them invisible?"

"Nobody knows. We do not know why the air is invisible; we only know that it is so. If you go out in a high wind, you can feel the air; you know that there is a substance rushing against you, but it is not to be seen. We know that most substances are invisible when in the gaseous form; but why they should be so, we do not know. The water which is produced by burning gas is kept in the gaseous form by the intense heat, and, when it cools, is deposited in little drops, like fine dew on the windows or on the outside of a cold pitcher. The carbonic acid may be condensed into a liquid by subjecting it to a pressure of 540 pounds to the square inch."

"Let us see; the atom of carbonic acid consists of one atom of carbon, which weighs 6.04, and two atoms of oxygen, which weigh—8, did you say?"

"Yes; but more exactly, 8 and 13-1 000ths—decimally 8.013."

"Then two of oxygen make 16.026, and one of carbon (6040) added, makes 22.066, as the weight of an atom of carbonic acid."

"I have talked, Charles, with a good many of the graduates of our colleges who did not understand this matter of atomic weights half as well as you do already."

"I should think you were fastening the carbon ball to the oxygen as if you intended they should never be separated."

"That is the case in nature. When oxygen and carbon unite, it is no temporary connection, but a marriage for life. They cleave unto each other through summer and winter—in rain and shine—in heat and cold. They will literally pass through water and fire without dissolving their union. This peculiar couple play a very important part in the operations both of nature and of art, and we shall find no more interesting inquiry than to follow carbonic acid in some of its curious paths. Where shall we follow it? Shall we track it through our own bodies, in its course through the stomach, and blood, and heart, and lungs? Shall we trace its wonderful history away back through the hundreds of thousands of years before man was created, and see how its harp tooth was cutting down the rocks when the earth was rolling, a hot and slimy globe, without an inhabant upon its surface? Or shall we first take a short course, and content ourselves with observing how it is absorbed by water and forced into the steam engine, and see what complicated contrivances have been invented for getting rid of it there? What do you say, John?"

"Tell us, sir, if you please, about the steam engine; I want to understand that more than anything else."

"Very well. That will lead us to investigate the relations of carbonic acid to water, and these are so constantly manifesting themselves in our food and drink, and in a thousand other connections, that I think this part of the history of carbonic acid will interest you more than any other part. But I have not yet explained to you how the light is produced when gas is burned. This is comparatively a late discovery, and is very curious. Though the union of oxygen with carbon is so strong, when it is once formed, these substances do not enter into combination as readily as oxygen and hydrogen. So, when gas issues from the jet and comes in contact with the oxygen of the air, the hydrogen is first burned; or, in other words, first enters into combination with oxygen. This produces an intense heat, which makes the carbon red-hot, or white-hot, and it is this hot carbon that gives most of the light. By making a draft from below, so as to consume the carbon at the same time with the hydrogen, illuminating gas may be burned with a very feeble light indeed. Now go to your play, and next Saturday we will follow the interesting couple—oxygen and hydrogen—in their wedded state of carbonic acid, right into the bowels of the steam engine."

TEMPERING STEEL.

Each variety of steel requires a different degree of heat, preparatory to plunging it in cold water, for the purpose of hardening. As it is very difficult to tell the degree of heat to which a piece of steel has been raised in a fire, the process called tempering provides for the difficulty. The steel is first heated in a clear fire to the highest temperature it will bear without being permanently injured, and is then cooled so as to impart to it the greatest hardness. It is then ground or polished so as to show a bright surface, and gently reheated until the bright surface shows a certain color. The colors produced by the increasing heat on the bright surface are, in succession, yellow, brown, purple, light blue, dark blue and black. These shades are used for the following purposes:—Yellow for lancets, razors, pen-knives, cold chisels and miners' tools; brown for scissors, chisels, axes, carpenters' tools and pocket-knives; purple for table-knives, saws, swords, gun locks, drill bits and bore bits for iron and metals; and blue for springs, small swords, &c. Articles which are to be softer are made still darker; but when the black shade is reached the steel is annealed and soft. These colors are the result of oxydation. The increasing thickness of the film of oxyd which accumulates on the bright surface of the steel is less and less apparent as the heat increases. Steel receives by sudden cooling that extreme degree of hardness combined with tenacity, which places it so incalculably beyond every other material for the manufacture of cutting tools; especially as it likewise admits of a regular gradation from extreme hardness to its softest state when subsequently reheated or tempered. Steel therefore assumes a place in the economy of manufactures unapproachable by any other material; consequently we may safely say that without it, it would be impossible to produce nearly all our finished works in metal and other hard substances.

In the process of hardening steel, water is by no means essential, as the sole object is to extract its heat rapidly; and the following are examples, commencing with the condition of extreme hardness, and ending with the reverse condition.

A thin heated blade placed between the cold hammer and anvil, or other good conductors of heat, becomes perfectly hard. A nearly similar variety of conditions might be referred to, as existing in cast iron in its ordinary state, for some cast iron may be rendered externally as hard as steel, such as chilled iron castings, which are cast in iron molds.

AT the zinc-paint works near Bethlehem, Pa., some 30 or 40 furnaces are in operation. The zinc ore yields 40 per cent of metal. This being subjected to an incandescent heat, the pure zinc descends, in vacuo, in the form of a fiery vapor, smoke and gas, and after passing through great pipes and receivers, it falls like a snow-shower as a white powder, which is the dry and perfect material for paint.

A COLUMN OF VARIETIES.

Ten cubic yards of hay in a stack will weigh about one tun.

The beautiful cosmetic called "violet powder" is composed of fine starch, scented with orris root. It is, perhaps, the safest powder which can be applied to the skin.

There are about 70 parts of starch in every 100 parts of fine dry flour. By the common processes of manufacture, about 25 per cent of this starch, at least, is lost; there is therefore a wide margin for improving the starch manufacture.

Many persons frequently require a dull, black varnish for the interior metal-work of telescopes and boxes. Such a varnish is made by simply adding lampblack to any spirit varnish. It should be dried in a cool place. About three ounces of shellac, dissolved in a pint of alcohol, with lampblack sufficient to color it, will answer every purpose.

In a letter to the Boston *Commercial Bulletin*, Donald McKay states that, by the middle of next year, when the vessels now constructing for the British navy shall be furnished, they will count 735 vessels, with 17,099 guns and a steam power of 132,786 horses. In guns, the French navy is only about half as strong as the English.

The New York and Erie Railroad Company have recently placed upon their road the most comfortable and perfect sleeping-car, probably, in the world. The entire length of the car, including the platform, is 65 feet, and it is 11 feet wide and 8 feet high. It has seats for 60 passengers, which seats can easily be changed into double or single berths, to accommodate 52 sleepers.

Oak trees in the French forests have been attacked this year by a strange disease. They are covered from the top branches to the roots with caterpillars, which form a coating some inches thick. In some localities, the municipal authorities have published a notice forbidding children to enter the woods. These insects, at the approach of a human being, cover the face, neck and body, and their sting has, in many instances, produced fever.

The *Spirit of the Times* gives the following rule for finding the weight of live animals:—"Take the girth behind the fore-arms in inches, and square it; take the length from the top of the shoulder in inches, and multiply the square of the girth by it; multiply that product by the decimal ·07958, and divide that product by 576, which gives the weight in stones of 14 lbs. each. The same rule applies to all classes of animals when thoroughly fat."

Magic pictures have been heard of which, when viewed in a certain point through a lens, exhibit an object perfectly different from that seen by the naked eye. Nicoron tells us that he executed at Paris, and deposited in the library of the Minimes, a picture of this kind. When seen by the naked eye, it represented 15 portraits of Turkish sultans; but, when viewed through the glass, it was a portrait of Louis XIII! This is as wonderful as the stereoscope.

During the past century, the cattle plague or murrain has made fearful havoc. In Germany alone, 28,000,000 head of cattle were carried off by it; and in the whole of Europe (including Russia, but exclusive of Siberia and Tartary), upwards of 200,000,000 have died of this pest. The special symptoms of this disease, in its early stage, are said to be a husky cough, which is increased, particularly after the cattle have been watered or moved about; less inclination for food, indifference as to chewing the cud, dullness of the hair and its rough appearance in particular places, and fever after these symptoms have continued for some time.

A thermometer does not indicate the amount of heat in a body, but merely its intensity and changes. Three divisions of measuring temperatures are used, viz.: Fahrenheit's, Reaumur's and centigrade. The former is in general use in the United States; the latter in France, and it is, like the French measures, the most convenient. In Fahrenheit's scale, the freezing point is called 32° and the boiling point 212°; when, therefore, the mercury stands at 0°, or zero, it is 32° below the freezing point. In Reaumur's scale, the freezing point is called 0° and the boiling point is called 80°. In the centigrade, the freezing point is 0° and the boiling point 100°.

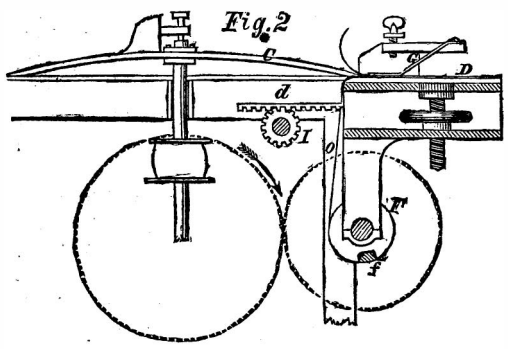
© 1860 SCIENTIFIC AMERICAN, INC.

IMPROVEMENT IN LEATHER-SPLITTING MACHINES.

Leather being so costly a substance great efforts are made to introduce economics in its manufacture and use in every direction. One plan for getting the most possible surface out of a given weight, is to split the thick hides into two thinner sheets. The annexed engravings represent an improvement in the mechanism for effecting this.

A thin, circular knife, C, Fig. 2, made dishing with the convex side uppermost, is made to revolve by suitable machinery, with its sharp edge just above a horizontal table, D, and the leather to be split is drawn over this table against the edge of the revolving knife. The lower sheet, O, of the split leather passes down below the knife around the feed roller, F, to which it is secured by the clamping bar, *f*. The leather is drawn along and pressed against the edge of the knife by the rotations of the feed roller, F, which is turned by the machinery at the proper speed for this purpose. The upper sheet, P, passes above the knife and is removed by hand. A series of springs, G, with their ends curved to fit near the cutting edge of the knife, are placed above the leather to hold it down close to the table. The shaft which carries the knife rests upon a stiff spring at the bottom, and is pressed down by a set-screw at the top, by which means its distance above the table may be regulated, and the thickness of the lower sheet of leather varied at pleasure. The table has racks, *d*, secured to its lower side, which racks mesh into pinions, I, the shaft of the pinions having a crank upon its end. By this means the table may be drawn back

Fig. 2



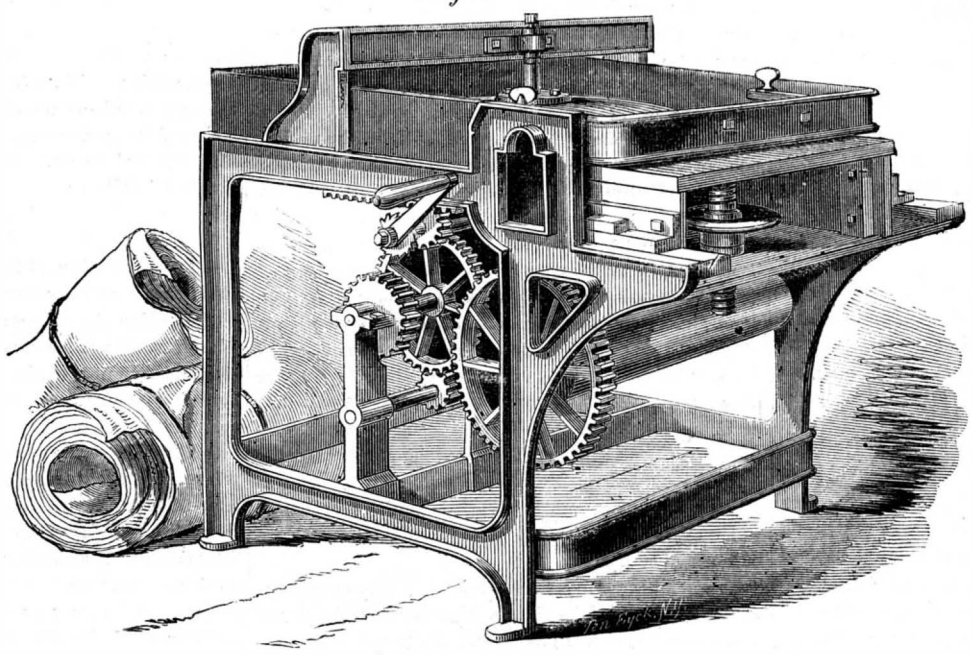
from the edge of the knife, for the purpose of placing the sheet of leather to be split upon it. After the leather is placed, with one end secured to the feed roll, the table is carried up to the knife, the machine started, and the operation proceeds.

The patent for this invention was granted November 23d, 1858, and further information in relation to it may be obtained by addressing the inventor, Henry E. Chapman, at Albany, New York.

ORIGIN OF IRON BRIDGES

The London *Quarterly*, in alluding to the new and varied applications of iron, gives Thomas Paine the credit of being the invento of iron bridges. It states that when he resided in Philadelphia, in 1787, he proposed to erect a bridge over the Schuylkill river, and that it should be of great span, without piers (so as not to be obstructed with ice). Paine boldly offered to build an iron bridge with a single arch of 400 feet span. In the same year, he went to Europe and sent a copy of his plan to Sir Joshua Banks, in London, who submitted it to the Royal Society. Paine then went to the Rotherham Iron Works, in Yorkshire, to have the design of his bridge carried out. Segments of an arch of 410 feet span were made of cast and wrought iron. The castings were then shipped off to London and erected on a bowling-green at Paddington. It was there visited by a large number of persons and regarded as a great success. Paine, being poor, became debtor for the castings, but his creditors at last agreed to take back the castings, and they used them on a bridge erected over the river Wear, at Sunderland, where it was erected in 1794. This bridge was long regarded as the greatest triumph of art. Its span exceeded that of any existing stone arch, being 236 feet, with a rise of 34 feet, the springing commencing 95 feet above the bed of the river, allowing vessels of 300 tuns burden to sail underneath without striking their masts. "If," says Mr. Stephenson, "we are to consider Paine as its author, his daring in engineering certainly does full justice to the fervor of his political career; for, successful as the result has undoubtedly proved, want of experience and consequent ignorance of the risk could alone have induced so bold an experiment; and we are rather led to wonder at than to admire a structure which, as regards its proportions and the small quantity of material employed in its construction, will probably remain unrivaled."

Fig. 1



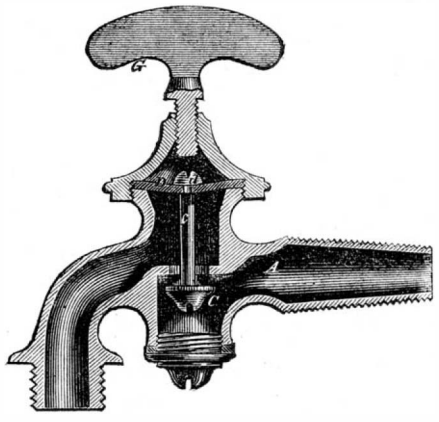
CHAPMAN'S LEATHER-SPLITTING MACHINE.

FLATTERY'S IMPROVED FAUCET.

This is a beautiful invention and it is just one of those little things that are always the best to make money out of.

The water enters at A, and is discharged at B. The valve, C, fits into its seat above, and is connected by its stem, *c*, with the flexible india-rubber diaphragm, D, to which it is secured by the screw, *d*. The faucet is closed by the pressure of the water against the valve, and it is opened by turning the thumb-screw, G, inward so as to press the valve downward away from its seat.

As the valve is held up against its seat merely by the



pressure of the incoming water, as soon as this pressure ceases, the valve falls down away from its seat, permitting a back flow outward, freely through the cock. This property adapts this faucet to many situations in which it is very valuable. For instance, a light boiler which is above the altitude at which water will be supported in it by the pressure of the atmosphere, will be saved from collapsing on the withdrawing of the water, by having one of these faucets inserted in it, as a supply cock. As soon as the pressure from the outside becomes less than that from the inside, the valve will open and supply the boiler with air. Again, in cases where the water is drawn from the pipes of a building, to prevent them from bursting in cold nights, if these faucets are used as draw-cocks throughout the building, the emptying of the pipes may be effected by a single valve and spigot in the lower part of the building, without any attention to the several faucets, each of which would open automatically and supply its portion of the pipes with air.

The patent for this invention was granted July 24, 1860, and further information in relation to it, may be obtained by addressing the inventor, James Flattery, at 17 Gates-avenue, Brooklyn, N. Y.

BRILLIANT PROSPECTS FOR THE FARMERS. — A writer in the *Herald* says: "I conversed, to-day, with a resident of Chicago, who has lately come in from the West. He reports that the people in the East have no idea of the revolution that the crop is producing in the Western States. Many farmers who sowed last fall and last spring, and calculated on a harvest, under favorable circumstances, of 20,000 bushels grain, will harvest 40,000. The yield of wheat per acre along the line of the Galena will, on the forest lands, be 25 bushels, while the best lands will yield over 40; the corn yield throughout Illinois will vary from 75 to 100 bushels to the acre. Mr. McCormick, the inventor of the reapers, has sold, during the summer, 4,000 reapers to the farmers in the neighborhood of Chicago. Should the price of wheat at Chicago not fall below 80 cents per bushel, our informant estimates that 12,000,000 bushels will arrive at that point between the 15th of August and 15th of October. I note already that yesterday (13th) the receipts at Chicago were 300,000 bushels of grain. The prices obtained by the railroads for carrying grain are generally satisfactory. It will be noticed that the advices from Europe, via Quebec, report a continuation of unfavorable weather for the crops."

A GOLD MINE IN A TAN-PIT!—On the 21st of last February, Messrs. Robinson & Eggleston, of Waukesha, Wis., obtained (through the Scientific American Patent Agency) a patent for an improved process of tanning hides, whereby tanning operations may be conducted altogether independently of the oak and hemlock barks of our forests, in any location where there is plenty of water, and a superior quality of leather (both upper and sole) is produced. In a letter dated August 11th, expressing the patentees' gratitude for our services in preparing their specification and prosecuting their case to a successful issue, they incidentally mention that they have just forwarded to Washington, for record in the archives of the Patent Office, a deed-of-transfer of an undivided interest in their patent, in consideration of the snug little sum of $150,000! This is a practical illustration of the aphorism of the Æsopian fable—"there is nothing like leather."

SEWING MACHINE CASES.—In the five suits brought under the A. B. Wilson feed patent for sewing machines, against Geo. B. Sloat & Co., J. G. Wilson *et al*, Judge Nelson has rendered a decision fully sustaining these patents and ordering a perpetual injunction to issue against the defendants. This decision seems to settle the validity of Wilson's feed patents, which have been in dispute. We alluded to these cases in our issue of the 7th inst. It was argued in June last, before Judges Nelson and Smalley, at Cooperstown, N. Y.

© 1860 SCIENTIFIC AMERICAN, INC.

Scientific American.

MUNN & COMPANY, Editors and Proprietors.

PUBLISHED WEEKLY

At No. 37 Park-row (Park Building), New York.

O. D. MUNN, S. H. WALES, A. E. BEACH.

TERMS—Two Dollars per annum.—One Dollar in advance, and the remainder in six months.

Single copies of the paper are on sale at the office of publication, and at all the periodical stores in the United States and Canada.

Sampson Low, Son & Co., the American Booksellers, No. 47 Ludgate Hill, London, England, are the British Agents to receive subscriptions for the SCIENTIFIC AMERICAN.

☞ See Prospectus on last page. No Traveling Agents employed.

VOL. III., No. 9.....[NEW SERIES.]....*Sixteenth Year.*

NEW YORK, SATURDAY, AUGUST 25, 1860.

SCIENTIFIC VERSUS CLASSICAL EDUCATION.

E see that New Haven, following the examples of Providence and Cambridge, has established a school for teaching the physical sciences, in which the scholars will not be required to go through the ordinary course of classical study. How much Latin and Greek shall be taught in our colleges is a question of more importance, perhaps, to the permanent well-being of the republic, than any of the political questions that are agitating the community, and it seems to us that the answer is not difficult. The English language is so largely derived from the Latin and Greek, that some knowledge of those languages is necessary to a thorough mastery of our own. It is important that a scholar should know the meaning of the roots from which our own words have come, and this is especially important for the student of natural history. The names of the several genera being almost all derived from the ancient languages, and being descriptive of the peculiarities of the genera, a knowledge of the meaning of the roots is absolutely necessary to enable most minds to remember the names. We believe the shortest way for a person to acquire a knowledge of zoology, botany and geology, is to devote a few months of preliminary study to the Greek and Latin tongues. The amount of knowledge of the classics sufficient for this understanding of the derivations is just about the amount which is now required for admission into our universities.

If our lives lasted a thousand years, it might be very well to devote four of those years to acquire a minute and critical knowledge of the language that was used by the ancient Greeks, and of all that was said, done, thought, believed, or imagined by that peculiar little people. Three hundred years ago, this might have been rational matter for instruction. But at the present time, it can only be acquired at the expense of other information. The accumulation of the knowledge of the universe possessed by our race has now become so great that it cannot be acquired by any individual, either in four years or in forty. A choice must be made between different kinds of learning. On the one hand there is this minute knowledge in relation to the Greeks, who were certainly a very intellectual people, and who produced many fine works on architecture, sculpture, oratory and poetry. But the gods whom they worshiped had no existence except in their own imagination; their history consisted to a large extent of incredible fables; their total knowledge of the universe was of the most superficial, meager, and unreliable character; and a very large part of all that they believed was a mass of delusions. Is it better to devote a given number of years to learning all these delusions, and the language which was the vehicle for their communication, or to bestow the same time in acquiring a portion of that vast mass of positive and accurate knowledge which has been accumulated by the patient and laborious research of the last twenty centuries? Since the directors of the Cambridge and Oxford seminaries first determined the course of studies there, how changed is the condition of the problem! Then a mastery of the classics comprised a considerable portion of the learning which it was possible to teach. But since that time, chemistry has grown to its enormous and constantly spreading extent. The primitive elements have been discovered, their course has been tracked through their innumerable groupings, and finally the great law of chemical combination has revealed itself in its simple and beautiful proportions to the long labors of successive investigators. An invisible universe, swarming with living beings, a thousand times more numerous than those which are to be seen with the naked eye, has been discovered, spreading about us on every hand, filled with strange, wonderful and multitudinous life. That long history which nature had contemporaneously written and laid away in the rocks, has been cautiously, patiently, faithfully and correctly interpreted. The vast globe on which we dwell has been weighed and measured. And not it only, but its sister planets also, and the great sun himself, notwithstanding the unapproachable distances at which they move in the depths of space, have all been subjected to the measuring rod, and laid in the balance, by human intelligence. The great problem of the sun's path, as he sweeps along with his attendant worlds on his long journey among the stars, has been grappled with, and is in fair way of being resolved. By his superior knowledge of the properties of light, the modern student has discovered, deep sunk in the abyss of space, myriads of worlds, the existence of which was undreamed of by the ancients, and the distances of which almost confound even those great minds which have been enlarged by the study of modern science.

Is not a knowledge of these actual truths of the universe more valuable than the mastery, however perfect, of the language and literature of the ancient Greeks? We should like to see all our colleges, while they require the same progress in the classics for admission that they do at present, abandon all further teaching of these in the college walls. The colleges are the proper places to teach the natural sciences; these absolutely require expensive apparatus, oral instruction and experiments, which can only be obtained by the combination of large numbers of students.

By one of the universal sentiments of human nature, we are all disposed to place a high value on the things which we possess; and this is especially true of our possession of knowledge. The sailor despises the man who does not know that the "sheets" are ropes, and the farmer looks with contempt on one who mistakes growing wheat for barley. Our college professors and presidents are not free from this common weakness of humanity, and, having acquired much knowledge of the classics, it is natural for them to regard this as the most valuable knowledge of all. We rejoice to see that, under the lead of Dr. Wayland, one of the broadest and greatest minds in the country, so many of these professors have broken through the trammels of this prejudice, and are exerting themselves to introduce a more rational course of instruction. We hope that, in this great and noble effort, they may receive the support of the press and the people.

AN INVENTOR IN LUCK.

A few days ago we were the recipients of a neatly folded envelope containing a pressing invitation to a banquet to be given by one of our brother "quills" to the editorial fraternity of this city. The gentleman by whom we were thus honored, and whose hospitality we very joyfully accepted, was no other than Mr. Moses S. Beach, the enterprising editor and proprietor of the New York *Sun* newspaper. His elegant and spacious mansion adorns a portion of the summit of that remarkable bluff or high ground known as Brooklyn Heights, which fronts directly upon the southern extremity of our metropolis, the swift waters of the East river intervening. From these hights a splendid view of the great city, its noble harbor and forests of shipping, may at all times be enjoyed.

The immediate occasion of the pleasant entertainment to which we have alluded was the retirement of Mr. Beach from the proprietorship of the *Sun*, and his desire to meet his editorial brethren to bid them a professional farewell. As to the banquet, it must suffice to say that it was as rich and splendid as art and liberality could possibly render it. Every delicacy of the season was provided in prodigal profusion, and the tables groaned under the weight of the good things with which they were loaded. Following the entertainment came "the feast of reason and the flow of soul." In a happy speech our host announced his retirement from the *Sun* paper, returned his acknowledgments to his brethren of the press for their kindness to him, personally, during his association with them, and bespoke their good-will and fellowship in behalf of Mr. Wm. C. Church, whom he then introduced as his successor. The latter-named gentleman made a very appropriate and interesting speech, and was followed by several prominent and gifted editors connected with the New York press.

Mr. Beach has, it appears, recently sold his interest in the *Sun* paper; and, though a young man, he retires with a large fortune, the fruits of his own industry, from the active duties of business life. When we state that the New York *Sun* is a penny newspaper, and that it has attained—under Mr. Beach's auspices—a daily circulation of between *sixty and seventy thousand copies*, we may, perhaps, convey some idea of the genius and untiring energy which he has displayed in the management of that popular and successful publication.

Mr. Church, who succeeds as publisher of the *Sun*, is a gentleman with whom we have long enjoyed a friendly acquaintance. He is an able business man; and we can only wish him the success which has crowned the labors of his predecessor. We cannot doubt that, under Mr. Church's active guidance, the great newspaper luminary will continue to "shine for all" with unwonted splendor.

We have entitled this paragraph, "An Inventor in Luck," because Mr. Beach, although an editor, is also an inventor of no inconsiderable rank. Some of his models adorn the cabinets of the patented inventions at Washington; and his name stands recorded, both in Europe and America, as the author and patentee of a number of valuable improvements. He is even now just completing the construction of a monster steam printing press, by which the sheets are cut from rolls, dampened, printed upon both sides at the rate of forty thousand impressions an hour, folded up, counted and delivered from the machine ready for the carrier and the mail. This machine is as high as a common two-story country dwelling house, and it will, when finished—if the expectations of its inventor are realized—constitute a most extraordinary specimen of mechanical skill and ingenuity. Thus it is that our inventors are to be found in every walk in life, always contributing something new and useful for the common benefit of mankind.

A GREAT HARVEST AND A GOLDEN REAPER.

In an article on another page of the present number, in regard to the cheering prospects of the crops, it is stated that, during this season, Mr. McCormick has sold 4,000 reapers. This statement is no doubt true, and affords an insight into the immense profits which some inventors make out of their patented machines. The McCormick reaper sells for $140 and $155—there are two sizes; it is safe, therefore, to calculate that the gross receipts of his sales this year will reach the enormous sum of $600,000, out of which he will realize a moderate fortune, say $100,000, the result of a single year's business! Unlike most inventors, McCormick is an energetic man of business; and he knows, just as well as any other shrewd person, on which side his bread is buttered. He is undoubtedly one of the wealthiest men in the North-west; and he not only has an interest in reapers, but he is a liberal supporter of religion, having not long since given $100,000 to endow the Presbyterian Theological Seminary, at Chicago, under the charge of the learned and astute Dr. Rice. Apparently not satisfied with his profits as a manufacturer, and his zeal in the cause of religion, he is endeavoring to mix up with these secular and sacred affairs the influences of modern politics; for, according to a recent announcement, he hoped to run the race for the mayoralty at Chicago with the accomplished "Long John Wentworth," but owing to an unexpected shuffle on the boards, the great reaper-man was cut down, and a Frenchman, named Gurnee, was put on the track, only to be beaten in the race by the longer legs of "Long John." It is reported that McCormick did not quite like the manner in which he had been left out of the political race; and, forgetting the injunction which says "revenge not yourselves but rather give place unto wrath," he straightway bought out the Chicago *Herald* for $5,000, and afterwards purchased up claims against the *Times*, of that city, amounting to $23,000, whereby he obtained a summary control over it. Thus equipped with the power of two newspapers combined, and an exchequer overflowing with the profits of his valuable patents, there is no knowing to what heights of renown he may yet attain.

© 1860 SCIENTIFIC AMERICAN, INC.

AMERICAN NAVAL ARCHITECTURE.

THE CLIPPER BARK "JAMES WELSH."

The hull of this ship was built by E. F. Williams, of Greenpoint, L. I.; her owners are F. Alexander and others; her commander is Capt. W. Magill; and the route of her intended service lies between New York and Belize (Honduras). In the erection of this vessel, various important improvements have been made upon the old method of ship-building. Her dimensions are as follows:—Length of keel, 110 feet; length of main deck, 120 feet; length over all, 129 feet; breadth of beam at midship section, 28 feet; depth of hold, 16½ feet; tunnage, 350 tuns; but she possesses a frame equal to a craft of 600 tuns. She is constructed of white oak and yellow pine, and all the parts are securely fastened with spikes, treenails, &c.

The after-house of this vessel is admirably arranged, as it constitutes both cabin and dining-room; it is 28 feet in length and contains eight staterooms for passengers, four on either side. The forward portion of this house is separated from the after-part, for the exclusive purpose of storing hides and miscellaneous merchandize, so that they may be open to the air, thereby receiving proper ventilation and preventing the existence of that usually unhealthy miasma which arises from the stowage of such articles in the hold.

A commendable arrangement is also observable in the forecastle of this vessel, and it is so superior to the old and miserably ventilated ones, which were so detremental to the health of seamen, that it should be extensively copied and substituted by all who, in building vessels, have any regard for the comfort of those that navigate them. It is erected on the main deck with two gangways on each side of the chain locker, and a commodious room on either side of the gangways, possessing four berths each. These rooms will at all times be kept dry and comfortable, for they will only be occupied as sleeping apartments; the gangways being sufficiently roomy to each admit of five persons to be seated at their meals, and can also be used to change clothing, and a protection from storms; each room has a ventilator, which, when used in action with the hatch in the top-gallant forecastle, and gangways, will permit a continual current of fresh air to pass through.

In addition to these essential features, she possesses two tanks in her cockpit, each of sufficient capacity to contain 525 gallons of water.

The plan of all these peculiar internal arrangements is solely attributable to the inventive mind of her principal owner; and they are such as to unhesitatingly recommend themselves to the attention of ship-builders, ship-owners and all parties who desire to alleviate the trials and discomforts of a much-abused and sadly-neglected class—our sailors.

LITERARY AND SCIENTIFIC NOTICE.

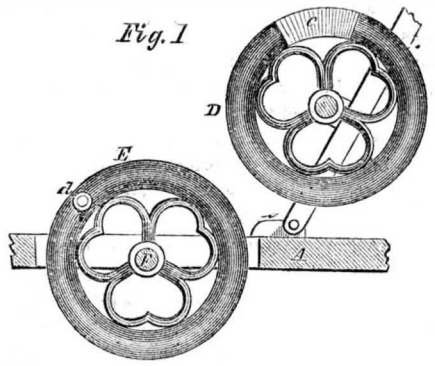
MUSPRATT'S CHEMISTRY.

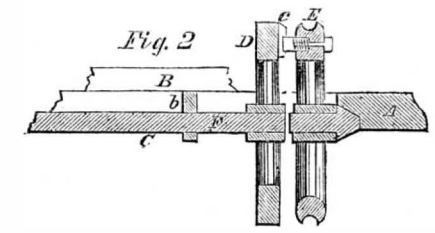
Messrs. C. B. Russell & Bros., publishers, of 12 Tremont-street, Boston, have just sent us the last-issued installment (Part 49, Letter P) of the above-named scientific periodical, which is altogether the most complete work ever published on chemistry applied to the arts and manufactures; its contents are arranged in the form of a cyclopedia, and illustrated by nearly 1,000 engravings of chemical apparatuses and a series of life-like portraits of distinguished chemists. The multifarious information is conveyed in as clear and plain language as the nature of each subject will allow, so as to render it thoroughly practical. We are pleased to learn that, although this publication has been extended beyond the limits originally contemplated, the interest and patronage of the public increases with each succeeding number issued. It is now decided that the whole work will be comprised within sixty parts. The above-named publishers have a branch office at the store of Messrs. Bailliere & Bros., of 440 Broadway, this city.

A MINIATURE steam engine, complete in all its details, was exhibited at the California State Fair, of about one rat power, manufactured by Henry Rice, watchmaker, of Sacramento. A steam attachment was formed with a copper pipe no larger in diameter than an ordinary straw, connecting with the boiler outside, from which it received its supply; and when under a full head, its fly-wheel performed over two thousand revolutions per minute. Nothing could be more beautifully accurate in its adjustment. The diameter of the cylinder is 3-16ths of an inch; stroke 7-16ths of an inch.

PERKINS' SEWING MACHINE ATTACHMENT.

There has long been a desire among sewing machine manufacturers to obtain some simple and unobjectionable mode of preventing the driving wheel from turning in the wrong direction. This is perfectly and beautifully accomplished by the invention here illustrated. This invention was described in a subordinate relation on page 72 of the current volume, where it was stated that the attachment was applied only to the Moore machines. It seems that the statement, from a singular misunderstanding, was erroneous. This, of course, being unsatisfactory to the inventor, we republish the description, with correct references, in order to do him full justice.





The driving pulley E, Figs. 1 and 2, and its shaft F, are disconnected from the shaft, C, which carries the works. Upon the face of the pulley, D, on the end of the shaft, G, is formed a wedge-shaped projection, *c*, having a square shoulder at one end, and inclining to a thin edge at the other. From the pulley, E, a pin, *d*, projects, which is pressed outward by a soft, spiral spring, bringit in contact with the square projection, *c*, on the wheel, D, when the pulley, E, is turned in the right direction, and allowing the pin to recede and thus pass over the projection, *c*, when the pulley is turned in the opposite direction.

The carrying shaft being entirely disconnected from the pulley and treadle, the opportunity is afforded of placing the works upon a table separate from the main table, to which it may be hinged, so that it may be turned over and the works exposed in a most convenient manner, for oiling or repair. The position of the second table when turned is shown in Fig. 1. This facility for inspection is a secondary but valuable feature.

This attachment, the patentee desires us to say, is applicable to *all* sewing machines which are driven by treadles, and is offered to the public generally.

The invention was made by Jonas Perkins, patented April 17, 1860, and assigned to N. S. C. Perkins, to whom inquiries for further information may be addressed at Norwalk, Ohio.

RECENT AMERICAN INVENTIONS.

The following inventions are among the most useful improvements patented this week. For the claims to these inventions the reader is referred to the official list on another page:—

VALVE GEAR.

This invention consists in a novel arrangement of two tripping bars connected with two rockshafts which carry or operate two induction valves which admit steam to opposite ends of the engine cylinder, in combination with a single rocker having an adjustable toe, whereby the induction of the steam is enabled to be effected in a positive manner at the commencement of the stroke of the piston, and the cutting-off is enabled to be effected at various points in the stroke of the piston under the control of a governor or of suitable means of adjustment by the hand of the engineer. The credit of this contrivance is due to Patrick Kenney, of Providence, R. I.

BOILER.

The object of this invention is to obtain a very cheap, simple, and strong steam boiler, of as small a size as be may desired, capable of using fuel very economically; and to this end it consists in a boiler composed of a lower annular water chamber with an upper annular water and steam chamber connected by two or more concentric circular series of upright water tubes, the inner series of which have bars arranged between them extending from the bottoms where the grate is placed, nearly to the top thereof to form a central circular fire-box, and the outer series of which are surrounded by a curtain-like cylinder extending from the bottom of the upper steam and water chamber nearly to the lower water chamber, and the whole being surrounded by an iron casing with which the chimney is connected. This device has been patented to G. W. Rains, of Newburgh, N. Y.

PHOTOGRAPHIC MEDAL.

This invention consists in a medal composed of a ring or plate of solid metal, constituting a frame or ring of a medallic character surrounding a picture or pictures produced by photography. The patent is assigned to the Waterbury Button Company, at Waterbury, Conn., who are now making 10,000, and expect shortly to make 20,000 medals daily, with portraits of the presidential candidates. This company will doubtless be glad to have eight candidates in the field in 1864. The patent must be a very remunerative one. The inventor is D. F. Maltby, of the above place.

TELEGRAPH LIGHTNING-ARRESTER.

We omitted in our last number to notice the lightning-arrester for telegraph offices, patented by D. F. S. Ways, of Baltimore, Md. The only means hitherto commonly adopted on electric telegraph lines for the protection of the operators and instruments from injury during thunder storms, has been either to disconnect the leading wires from the binding screws on the magnet block, or to open the main circuit within the office by means of a cut-off, but neither of these means effect more than the prevention of the destruction of the magnet, as they do not prevent the entrance into the office, of the atmospheric electricity, and the operator is exposed to great danger in their use from contact with the wires and other conductors. The object of this invention is to enable the operator within any office on an electric telegraph line, without touching any portion of the main circuit, to suspend and renew electrical communications between the main wires and the interior of the office, or of the building in which the office is situated; and the invention consists in effecting such object by the use of an electric current independent of the main line, such current working the armature of an electro-magnet, which, by opening and closing the said current, is made to open and close the main line, outside of the building in which the office is situated.

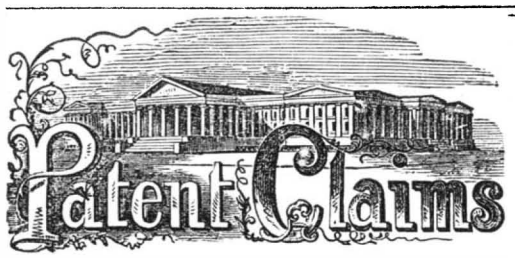
APPLICATIONS FOR THE EXTENSION OF PATENTS.

Bell Telegraph.—A. Judson and E. N. Jackson, administrator of T. D. Jackson, deceased, of New York City, have applied for the extension of a patent granted to said A. Judson and T. D. Jackson on the 17th of October, 1846, for an improvement in the above-named class of inventions. The testimony will close on the 17th of September next; and the petition will be heard at the Patent Office on the 1st of October.

Artificial Leg.—B. Frank Palmer, of Philadelphia, Pa., has applied for the extension of a patent granted to him on the 4th of November, 1846, for an improvement in the above-named class of inventions. The testimony will close on the 8th of October next, and the petition will be heard at the Patent Office on the 22d of that month.

LONDON STEAM FIRE-ENGINE.—The London *Times* describes a new steam fire-engine which has lately been tried in that city, and which is highly commended. The cylinder and pumps are made of gun-metal, the valves are of india-rubber, the boiler is of the upright tubular construction, affording ample means for superheating the steam; there are 199 brass tubes, one and one-fourth inch outside diameter, and 15 inches long. The fire-box is of copper, three feet four inches in diameter; the cylinder is eight and one-half inches in diameter, with a six-inch stroke; one water cylinder is six inches in diameter, with six-inch stroke, the other, seven and three-eighths inches in diameter, with a four-inch stroke, the two being equal in cubic contents.

© 1860 SCIENTIFIC AMERICAN, INC.



ISSUED FROM THE UNITED STATES PATENT OFFICE
FOR THE WEEK ENDING AUGUST 14, 1860.

[Reported Officially for the SCIENTIFIC AMERICAN.]

*** Pamphlets giving full particulars of the mode of applying for patents, *size* of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

29,555.—J. P. Allen, of Dover, Ga., for an Improvement in Seed Planters:

I claim the arrangement of the two halves of the hopper, g g, adjustable bars, d d, oscillating shaft, H, arm, I, rod, j, bar, K, and straps, k k, as and for the purpose shown and described.

[This invention is more especially designed for planting cotton and other seeds, the discharge of which from the hopper or seed-box is attended with difficulty on account of lint being attached thereto, as in the case of cotton seed, or on account of an irregular form, or a viscid coating which some seeds possess.

29,556.—Wm. Bailey, of London Grove, Pa., for an Improved Machine for Bending Tires:

I claim the roller, F, when adjusted vertically through the medium of the frame E, and double inclined plane G, and the bridle. D, with its hooked legs, d d, and screw, c, when they are arranged in respect to and in combination with the continuous wheel, C, substantially as described and for the purpose specified.

29,557.—J. C. Baker, of Mechanicsburg, Ohio, for an Improvement in Fruit Jars:

I claim the peculiar conical form of the cap, C, with a depression in the apex for the pivot, e, and a groove around the base for the gasket, a, when employed in combination with the clamp, D, and inclines, B B', as and for the purpose set forth.

29,558.—L. W. Baker, of Marlboro', Mass., for an Improved Bread-slicer:

My improvement and what I claim consists not only in constructing the knife with the stud pins, b, made to project from its opposite sides, but in constructing the standard or carrier, B, of two vertical plates, d d, made with two curved slots, c c, and an opening, e, leading out of each, in the manner explained and represented.

29,559.—J. G. Barker, of Watertown, Mass., for an Improved Cheese-cutter:

I claim the above-described cheese-cutter, having its knife, K, guided by the grooved rod, M, and operating in the manner substantially as described.

29,560.—P. M. Belton, of Brooklyn, N. Y., for an Improvement in Compounds used as Decolorizers:

I claim the composition substantially as specified by combining chalk, or its equivalent, with peat, so as to form, after carbonization, a mass which may be used as a substitute for animal charcoal in sugar refining, essentially as set forth and for other analogous purposes or uses.

29,561.—L. R. Blake, of Abington, Mass., for an Improvement in the Manufacture of Boots and Shoes:

I claim uniting the bottoms and vamps of boots or shoes with stitches made without passing the end and length of the unused thread through the parts united by interlocking one loop of the thread with another, and extending through the said parts, substantially as shown and described.

39,562.—L. R. Blake, of Abington, Mass., for an Improvement in the Manufacture of Boots and Shoes:

I claim, as a new article of manufacture, a boots or shoe in which the bottoms and uppers are united with stitches made without passing the length and end of the unused thread through the parts united by interlocking one loop of the thread with another, and extending through the said parts.

29,563.—J. N. Bodine, of Bridgeton, N. J., for an Improvement in Bottles:

I claim, first, A bottle constructed with vertical and short horizontal grooves on the interior of the neck, substantially as described for the purpose set forth.

Second, The method of fastening the cork in the bottle, by means of vertical and horizontal grooves, in combination with an independent plug or block.

29,564.—J. P. Bond, of Greenwood, S. C., for an Improvement in Plows:

I claim the arrangement of the curved brace, G, beam, A, with its clevises, C C, stock, E, crossbar, D, and stilts, B B, as and for the purpose shown and described.

[The object of this invention is to construct the ordinary single shovel plow in such a manner that it will not need the usual diagonal brace, which greatly obstructs the forward movement of the plow through the ground on account of its gathering weeds, grass, &c., and it will be firmly and rigidly braced, and secured against backward pressure.]

29,565.—S. G. Brett, of Newport, N. H., for an Improved Machine for Pointing Shoe Pegs:

I claim, first, The elastic pressure rollers, G G, the fluted rollers, F F, or any equivalent substitute for the latter, and the angular or screw-like roller, X, in combination with the tool-stock, H, arranged and operating as set forth.

Second, The improved tool stock, H, with two or more pointing tools, a a, running in the same groove, arranged as above set forth.

29,566.—B. W. Bruel, of Beloit, Wis., for an Improved Mop-holder:

I claim the slotted hole and pin by which the jaws, B' B2are rendered self-adjusting, in combination with the bifurcated handle, A, and retaining clasp, the whole arranged and operating as described for the purpose set forth.

29,567.—L. D. Burch, of Sherburne, N. Y., for an Improvement in Plows:

I claim the combination and arrangement of arms, D, rods, E, slotted cross-head, F, clevis, H, cord, L, or its equivalent, substantially as set forth, for the purpose shown and described.

29,568.—E. G. Burger, of Ypsilanti, Mich, for an Improvement in Foot-scrapers:

I claim the arrangement of the inclined plate, D, provided with plane and convex surfaces, b c, and the uprights, B B, having curved flanches, the above parts being used with or without the brushes, C, as and for the purpose set forth.

[The object of this invention is to obtain a foot-scraper, by which the boot or shoe may be more effectually cleaned than by the ordinary scrapers, provision being made for thoroughly cleaning the sides of the sole and upper, as well as for cleaning the instep of the sole, and front part or side of the heel, portions which are generally slighted in consequence of the difficulty and in many cases impossibility of cleansing them by the ordinary scrapers.]

29,569.—Saml. Canterberry, of Holmes county, Miss., for an Improvement in Plows:

I claim the arrangement of the beam, Z, helve, a, rod, e, bolts, c and d, hands, f, bar, b, piece, h, and moldboard, g, the whole being constructed and combined in the manner and for the purposes set forth.

29,570.—Daniel S. Chase, of Augusta, Ga., for Improved Anti-friction Rollers for Propeller Shafts:

I claim the combined use of the two sets of anti-friction rollers, constructed substantially as described, one set on each side of the disk or collar of the shaft.

29,571.—W. H. Churchman, of Janesville, Wis., for an Improvement in Furnaces for Heating Buildings:

I claim, first, The combination and arrangement of the fire space with or without the grate, s, central flue, d, smoke damper, T, return flues, b b, covering plates, v v v, openings in plates, x x, and exit opening, a, with or without the T-pipe for returning the smoke to the chimney, substantially as described, whereby the heat is economized and diffused over the surfaces of the rarefiers, C c C'.

Second, The arrangement of the hot air chambers, A, cold air-chambers, B, and connecting flues A', B', in the walls of the furnace with or without the stop dampers, M N O O', substantially as described, whereby all or any number of the rarefiers, Cc C', may be connected at pleasure.

Third, The combination and arrangement, of the evaporating pans P B, flues, R R, and registered openings, 2 2, substantially as set forth, whereby any required degree of heat may be imparted to the water in the pans, and all of the warmed air made to pass directly over the surface of the same in its passage from the furnace.

Fourth, The combination and arrangement of the rarefiers, C c C', hot air-chambers, A, cold air-chambers, B, connecting flues, A' B', stop dampers, M N O O', ventiducts, D F E G, registers, H I J K, and dampers, L, above the registers, substantially as described, whereby the warming and ventilating currents may be perfectly controlled as set forth.

29,572.—P. S. Clinger, of Conestoga Center, Pa., for an Improved Machine for Cutting Fodder:

I claim the combination of the bar, K L, sliding chairs I, with their slotted semi-circular knives, H, square ended and slit screws, C C2, sliding table, D, in the cap, c, with its binding rod and screw, r r, when combined as set forth for the purpose specified.

29,573.—Richard Cranston and Henry Bates, of New London, Conn., for an Improvement in Projectiles for Fire-arms:

We claim the employment of the washer, e, in combination with the tube, C, or its equivalent, and chamber, d, so that the pitch, while in a plastic state, may be compressed around the fuse rope and the surplus pitch be allowed to escape, substantially as and for the purpose shown and described.

[This invention is an improved mode of fastening the fuse rope or cord in bomb lances or other projectiles. It consists in coiling a quantity of the fuse rope in a chamber formed by a partition in the shell of the bomb and by the breech-nut, and of such a size that a quantity of the fuse may be coiled through and surrounded by pitch or some other resinous substance, which is squeezed down into the chamber, so as to keep the coils of the fuse rope separate; and from this chamber the end of the fuse is presented in the proper central position by means of two washers, the inner one of which, together with a suitable gaging tube, serves to compress the pitch while it is in a plastic state; while the outer one, which is made of india-rubber or leather, serves to protect the inner washer against the influence of the fire from the gun.]

29,574.—J. S. Davis, of Tiffin, Ohio, for an Improved Washing Machine:

I claim, first, The arrangement of the grooves, b, in the sides of the tub, A, and furnished with steps, c, in combination with the pawl or pawls, d, and ratchet teeth, e, substantially as described, for the purpose of adjusting the washboard to the height of the operator.

Second, The arrangement of the adjustable washboard, B, with a roller surface, e', in combination with the reciprocating hinged rubber, D, being guided in its motions by grooves in the side flanges, f, of the washboard, and operating in the manner set forth.

Third, The combination with the washboard, B, and reciprocating rubber, D, of a hook, F, constructed and operating substantially as and for the purpose specified.

[The object of this invention is to construct the washboard and the roller in such a way that the former can be adjusted to suit the hight of the operator and the quantity of clothes to be operated upon; and the latter being hinged, it adapts itself to the clothes that may be put upon the washboard.]

29,575.—John Devlin, of Philadelphia, Pa., for an Improved Lever Escapement for Watches:

I claim the application to the lever of the banking springs, f f', constructed and arranged to operate in the peculiar manner described.

29,576.—H. D. Dunbar, of Memphis, Tenn., for an Improvement is Pistons for Steam Engines:

I claim, in combination with the solid or uncut ring, A, the segmental or cut rings, e i; the latter fitting into the angle of the former, and both breaking joint with each other; said rings, e i, being held out by the action of the steam in the cylinder, mainly to pack the piston, as represented.

29,577.—Jacob Edson, of Boston, Mass., for a Street sweeping Machine:

I claim, first, Forming the rim of the driving-wheel with a series of sectional projections, teeth or cogs, that are susceptible of being removed and replaced when worn, at pleasure, substantially as described.

Second, Arranging the broomshaft, b b, diagonally with and across the line of the driving-wheel, w w, and supporting-wheel, a' a', as described and represented in the drawings, so as to easily balance the apparatus, however heavy the brooms and their shafts may be, with the use of but two wheels, permit the greatest possible width of broom being obtained, and enable the brooms to sweep close up to the edge-stone, as set forth.

Third, Attaching the brooms directly to their shaft by means of the volute springs, c c, so that they will bear with an elastic-yielding pressure upon and adapt themselves to the inequalities of the surface to be swept.

Fourth, The arrangement of the dish-shaped driving-wheel and gear attached to the same, in the manner and for the purpose described.

Fifth, The arrangement of the swinging bar, k, playing in the vertical standard, l, and forming a bearing for the broomshaft, as described.

Sixth, The use of the elastic band and strap, v, operating as described, with the swinging bar, for the purpose set forth.

Seventh, Hanging the supporting-wheel, a' a', in the hinged frame-work, as described, and for the purpose specified.

29,578.—J. S. Fowler, of Peoria, Ill., for an Improvement in Corn Planters:

I claim a seeding cylinder, arranged with its axis parallel to the line of motion of the machine, and having an alternate rocking motion in opposite directions, in order to scatter the seed laterally, in combination with a sled-runner drill plow, constructed and arranged substantially as described, for the purpose as set forth.

29,579.—R. W. Gardner, of Quincy, Ill., for an Improvement in Governors for Steam Engines:

I claim supporting the spindle of a governor on the head of a valve stem, but unconnected therewith, in combination with an adjustable weighted lever, tending to keep the several parts in close contact and partly balancing the weight of the moving parts of the governor, substantially in the manner and for the purposes described.

29,580.—R. M. Garrettson, of Rhinebeck, N. Y., for an Improved Camp Stool:

I claim pivoting the arms, B B B B, and the legs, E E E E, to the slotted block, A, and connecting these arms and these legs together by the peculiar joint described, so that the ends of said arms will act upon the ends of said legs in the block, A, in opening or closing the arms.

[This invention consists in so pivoting the legs and arms of the stool to a block that each arm will form a brace for its respective leg; and thus, when the arms are spread out and the canvas seat stretched over them, and a weight put upon the seat, the legs will be spread out and firmly held in this state; so, also, when the arms are contracted in folding-up the stool, the legs will be drawn together and held in that state.]

29,581.—Wm. L. Gebby, of New Richland, Ohio, for an Improvement in Seed Planters:

I claim the combination and relative arrangement of plow share, R, harrow, U U S, coverers, T T, seed-box, B, semi-circular valve, I, curved bar, L, and connecting-rod C, spring, H, and levers, D H, substantially as and for the purposes set forth.

29,582.—W. Y. Gill, of Henderson, Ky., for an Improvement in Air Pumps for Exhausting and Sealing Cans:

I claim, first, Constructing and combining the plunger and air pump, substantially as described, so that one plunger may be used for the double purpose of exhausting the air and driving the stopper firmly into the mouth of the can or jar, as set forth.

Second, Suspending the lower end of the main cylinder a suitable distance above the mouth of the can or jar, by means of an enlarged cylinder cup attached to said end of the main cylinder substantially as and for the purposes set forth.

29,583.—Schuyler Goldsmith, of Wataga, Ill., for an Improvement in Cultivators:

I claim the combination and arrangement of the seat, G, draft pole, I, racks, J K, and axle, E, applied to the frame, A, substantially as and for the purposes set forth.

[The object of this invention is to obtain a cultivator which will admit of being adjusted or raised and lowered bodily while the operator is seated on the implement; and also admit of having its front part raised or lowered, as circumstances may require.]

29,584.—B. A. Goodell, of Millbury, Mass., for an Improved Rotary Engine:

I claim, first, The arrangement, in combination with the hollow piston wheel, E H, and the pistons, F F, of the cam, b c d, attached to the journal-box, I, which receives the inner end of the shaft and inclosed within the piston wheel, substantially as described.

Second, The arrangement of the valves, n u u', and their connections, w v v', in combination with the single induction passage, q, and its branches, r r', and the two exhaust pipes or passages, t t, substantially as and for the purpose specified.

[This makes a very simple rotary engine. The peculiarities cannot, however, be well explained without a drawing.]

29,585.—C. F. Grabo, of Boston, Mass., for a Copying Press:

I claim, first, The combination of the rod, G, with the levers, N and M, acting simultaneously upon the top and bottom platen of a press, in the manner and for the purpose substantially as described.

Secondly, I claim the manner of attaching the upright bolt, E, to the top platen, as described, and for the purpose substantially as specified.

29,586.—Gottlieb Graessle, of Hamilton, Ohio, for an Improvement in Drain Tile Machines:

I claim, first, The oil-boiled wooden molds, g g', constructed and applied in the manner and for the purpose set forth.

Second, The combination and arrangement of the tempering tub, B C D E, grated sides, F H, sliding frame, I I', valves, b, and molding tubes, G, constructed and operating in the manner and for the purposes set forth.

29,587.—J. C. Goar, of Monterey, Cal., for an Improved Belt-shipper:

I claim the arrangement of the pivoted locks or stops, E E', and their spring, G, upon the face of the belt-shipper or slide, B, in the manner shown and described, so that pressure upon either of the cords, H H', will first unlock the corresponding stop and then move the slide; all as set forth.

[This invention consists in furnishing the slide, by whose movement the belt is moved from one pulley to another, with two self-acting spring stops, one of which engages with a stationary notch to lock the slide in a position to hold the belt on one pulley, and the other with a similar notch to lock the slide in a position to hold the belt on the other pulley, and attaching the said stops to two cords or chains, so applied that, by pulling one of the said cords or chains, the slide is first unlocked, and then moved to ship the belt on to one pulley; and by pulling the other one, the slide is first unlocked, and then moved to ship the belt on to the other pulley, and afterwards locked.]

29,588.—Wm. H. Greenwood, of Galva, Ill., for an Improved Lock:

I claim the general form and arrangement of the plungers, P, of the key, as described, so that all of the changes can be made in the key, thereby making it a "mental" lock or not, as wished; together with the general form and arrangement of the bolts, A and B, the rack and pinions, D and C, with the frame and lever, E and F, in the manner described, so that the lock will accommodate itself to the key.

29,589.—Asa Greenwood, of Toulon, Ill., for an Improved Tenoning Frame:

I claim the combination and arrangement of the two bearers, E E', the shoulder gages, D D', the holding recess, B, and the back gage, M; such being for the formation of rebates on opposite sides of "stuff" by a plane, so as to make a tenon on such stuff, as described.

I also claim the combination of the adjustable bars, L K', with the tool bearers, E E', the shoulder gages, D D', the holding recess, B, and the stop bar, M, arranged and applied together, substantially as specified.

29,590.—J. S. Hall, of West Manchester, Pa., for an Improvement in Plows:

I claim uniting a plow-standard to a plow-beam, by means of ratchet and flanged plates arranged on the sides of the beam and standard, so as to admit of folding-up, substantially such as described.

29,591.—J. S. Hall, of West Manchester, Pa., for an Improvement in Plows:

I claim a shoe or support as a device for fitting a straight handle to the back of a moldboard of a plow, when said shoe is made as described, of cast or wrought iron or of steel, and bolted or riveted to the moldboard, as stated.

© 1860 SCIENTIFIC AMERICAN, INC.

29,592.—L. E. Hawkins, of Sangamon, Ill., for an Improvement in Cultivators:

I claim the arrangement of the oblique stocks, J′, plows, J, vertically inclined stocks, I′, plows, I, rods, a b, frame, A, axle-tree, B, wheels, C C, pole, D, lever, E, and seat, G, as and for the purpose shown and described.

[This invention consists in attaching to the rear of a carriage frame, capable of being raised or depressed, three tines or shovels, so arranged that in once passing through the field between the young plants, they will loosen the soil on both sides of one row and on one side of each adjacent row; so that, virtually, two rows are cultivated. Still, the shovels are so disposed that the machine may be easily and properly guided between the rows.]

29,593.—A. A. Henderson, of Philadelphia, Pa., for an Improvement in Reaping and Mowing Machines:

I claim the rake, 4, having an upright part and obliquely-descending prongs, in combination with the endless chain or rope, arranged and operating as described, for the purpose of discharging the grain in gavels at intervals.

29,594.—A. A. Henderson, of Huntington county, Pa., for an Improvement in Machines for Reaping and Raking Grain and Mowing Grass:

I claim the combination of the rake, e, and horizontally-traveling endless belt or chain to which it is attached, with the platform, K′, and sideboards, a b, or their equivalents, substantially as described, for discharging the grain in gavels at intervals.

29,595.—J. G. Howard, of South Braintree, Mass., for a Machine for Applying Washers to Tacks:

I claim the combination and arrangement of the lifter, O, and vibrating hopper, M, or their equivalents, with the tack-adjusting chute, L; the same being made to operate together, substantially as explained.

Also, the combination of the agitators, T T, or their equivalents, with the lifter, O, and the vibrating hopper, M; the said agitators being made to operate therewith substantially as and for the purpose specified.

Also, the combination of the notched tack-receiving and carrying wheel, K′, and the lever, u, or the tack-separating mechanism, as described, with the adjusting chute, L, receiving tube, I, and its mechanism for driving the tack into the leather, as described.

Also, arranging and combining with the tack-adjusting chute, L, mechanism for agitating the same laterally, in manner and for the purpose set forth.

Also, combining the nippers or jaws, a2 a2, with the punch-plate carrier, c2, so as to be movable therewith, substantially as described.

Also, the combination of a spring presser, g2, as described, with the tack-receiver, I, and its operating arm or lifter bar, G.

Also, the combination of the auxiliary discharger, L1, with the carrying wheel, K′, and the receiving tube, I.

Also, the combination of the lever plate, l′, and its spring, m′, or equivalent mechanism, with the chute, L, and the carrying wheel, K′; the said lever plate being arranged in the manner and to operate with the chute and wheel as explained.

29,596.—J. M. Hunter, of New York City, for an Improvement in the Preparation of Glue:

I claim the above-described glue as a new article of manufacture; the same being made from whale-blubber scraps, substantially as described.

29,597.—Sabin Hutchins and J. D. Leach, of Penobscot, Maine, for an Improved Churn:

We claim the arrangement of the churn, C, the pump, D, the sink, B, the lever, k, the pitman, g, the actuating shafts, r and t, the toothed wheels, e and f, and the hand crank, h, substantially in the manner and for the purpose set footh.

29,598.—Nicholas Jenkins, of New York City, for an Improvement in Wagon Springs:

I claim the combination, with the springs, A A, of friction plates, G, springs, g, and set screws, h, constructed and operating substantially as and for the purpose described.

[The object of this invention is to obtain greater extent of motion with small springs. The invention consists in combining with each spring an arm, one end of which is pivoted to the casing containing the spring, which rests on a knife-edge-shaped head of the spring close to its pivoted end, in such a manner that the long end of the arm, which connects with the platform or body of the wagon, is allowed to move up-and-down through a comparatively large space with a very small motion of the springs; also, in combining the springs with friction plates and set screws, in such a manner that their action can be regulated according to the load on the wagon; also, in arranging each spring with a separate tension nut, so that its action can be regulated, and that its tension can be increased if the load on the wagon requires it.]

29,599.—Josee Johnson, of New York City, for an Improved Clothes-dryer:

I claim, in combination with the hinged frame or rods, A B C, and suspending cords, F G H, the straining cords, L M or N, operating to secure and release the rods; and the whole being arranged for action together, substantially as specified.

29,600.—Herrmann Jury, of New York City, for an Improved Spring Mattress:

I claim the arrangement of wire frame cells and springs, A, in combination with smooth fastening plates, D D, in the manner described, and for the double purpose of increasing the flexibility of the wire frame and obviating the necessity of cord or wire bindings, as set forth.

29,601.—Lathrop Kazar, of Leroy, Ill., for an Improvement in Adjustable Moles for Mole Plows:

I claim the peculiar arrangement of the landsides, A, with respect to the adjustable apron, C, as operated, and inclined plane, D; the whole being constructed in the manner and for the purposes set forth.

29,602.—Wm. Kenyon, of Steubenville, Ohio, for an Improved Gas Pipe-cutter:

I claim the combination of a chisel, D, of a gas pipe-cutter, with a stationary and a revolving chuck, F and A, a crankshaft, U, bevel gearing, I H, cog-wheels, B C, and screwshaft, J, or their equivalents, for the purpose of revolving the chuck, F, and feeding the cutting tool, D, forward, by the automatic action of the parts of the implement, substantially as set forth.

29,603.—Wm. Kimmel and Daniel Kimmel, of Cambridge City, Ind., for an Improvement Stump Extractors:

We claim the combination and arrangement of the capstan, B, lever, D, and shiftable roller, C, for applying the power at different speeds, substantially as set forth.

29,604.—Patrick Kenney, of Providence, R. I., for an Improvement in Valve Gear for Steam Engines:

I claim the arrangement of the two tripping-bars, L L, jointed to arms of the valve rockshafts, and working on guides or stops, M M, in combination with the single rocker, N, and its adjustable toe, d; the whole operating substantially as described.

29,605.—G. H. Laub, of Newark, Mo., for an Improvement in Carriage Springs:

I claim the arrangement and combination of flat curved springs, C C, and arms, A A′, when said arms are controlled by the segment gear on the contiguous portion of said arms and by the action of spiral spring, K, as described and represented.

29,606.—J. B. Lyons, of Milton, Conn., for an Improvement in Stump Extractors:

I claim the combination, with a jointed frame, A A and B, as described, of the wheels, F F, serving a twofold purpose, gear wheels, p G, drum, H, pulleys, c c c, and block and tackle, I J; all arranged and made to operate in the manner and for the purposes described and represented.

[This invention consists in the employment of a jointed tripod framework, constructed of strong timber and suitably braced, to which are applied pulleys, a block and tackle, grapple hooks, a capstan and two large hand-wheels, which answer the purpose of carriage wheels for moving the frame about from place to place; it further consists in a novel device for adjusting the grapple hooks on their chains for adapting them to rocks or stumps of different sizes.]

29,607.—R. M. Lytle, of Triune, Tenn., for an Improvement in Portable Scaffolds:

I claim, first, Connecting the posts by means of transverse girders, arranged substantially as described, so that one or more may be taken-out or put-in without displacing the other parts of the frame.

Second, Arranging the bands confining the girders to the posts, so as to form splicing sockets to receive the two ends of the posts at the point where it is spliced.

Third, The combination of a double wedge with two bands for strengthening the splicing of the post, when arranged substantially as described, for the purpose set forth.

29 608.—John Magee, of Lawrence, Mass., and Wm. J. Towne, of Newton, Mass., for an Improvement in Stoves:

We claim the described arrangement of the valve box, its valve and leading and discharging conduits, relatively to the mouth of a furnace, and a discharge opening situated in rear of the fire-pot, as specified.

29,609.—Robert Marcher, of New York City, for an Improvement in Enameling Picture Frames, &c.:

I claim the combination of a movable tool, mounted substantially as described, for laying enamel or composition on curvilinear frames, with a face-plate carrying the frame to be enameled, and a pattern of the form required to move the tool, substantially as and for the purpose specified.

And I also claim the combination of two or more movable tools, mounted substantially as described, so that each shall be capable of independent motions, with the face-plate carrying the frame to be enameled and two or more patterns, one for imparting the required motion to each tool, substantially as and for the purpose specified.

29,610.—Charles Marston, of Viroqua, Wis., for an Improvement in Grain Harvesters:

I claim, first, Operating the two sickles, G G, through the medium of the levers, k k, reciprocating slotted plate, F, vibrating lever, g, actuated by the crank, c, of the shaft, E, which derives its motion from the wheel, C, substantially as set forth.

Second, Operating the rake, K′, intermittingly through the medium of the teeth, w, arranged in sections on wheel, D, and the pinion, v, on shaft, M; and also the crank pulley, L, connected by the pitman, u, with the sweep or bar, I, having the slide, J, with the pendant, s, and the rake bar, j, attached; all being arranged substantially as described.

Third, The arrangement of the endless bands, a′ c′, in connection with the binding clamps, f′ g′, and their operating mechanism, substantially as shown, whereby the gavels are conveyed to the clamps, bound, and the sheaves conveyed to the platform, T, for the purpose of being discharged in shocks.

Fourth, The platform, T, attached to the shaft, U, as shown and described, and provided with the bars, X V′; the bar, X, having a pin, p′, attached, and also a cord, l′, and the weight, o′, connected to it; the cord being arranged with bar, V′, and the latter provided with the catch, k′, to operate as set forth.

Fifth, The arrangement of the shafts, B′ B″, with the caster-wheel arbor, r, and the cam, C′, as shown, for the purpose of elevating the front part of the machine, when required.

Sixth, The arrangement of the caster wheel, Y, with the pinion, s′, on its arbor, r′, the segment, t′, and lever, z, connected with the neck yoke of the team or with the mechanism of any motor, to operate as set forth.

[This invention has for its object the obtaining of a machine by which standing grain may be cut, raked into proper gavels, bound and discharged from the machine in shocks. The invention consists in a peculiar arrangement of means employed for this end, so that the grain will be cut and operated upon, consecutively, by the different parts, which are so devised as to admit of animal or steam-power being applied.]

29,611.—John Maurer, of New York City, for an Improvement in Bottles:

I claim, first, The arrangement of the doubly-inclined channel, a, around the spout, B, of a bottle, in combination with an opening, b, in the side of said spout and at the lowest point of said channel, substantially as and for the purpose specified.

Second, The combination of the doubly-inclined channel, a, with the packing ring, substantially as described, so that, by the action of the channel, the packing ring is protected against the injurious influence of such portions of the contents of the bottle which, in pouring out, may run down on the outside of the spout.

[This invention consists in arranging around a perforated or slotted spout or neck of a bottle, a double inclined channel, in such a manner that such portions of the liquid which, in pouring-out, will run down over the outside of the spout, are conducted back through said channel to the opening in the side of the spout, and through said opening back again into the bottle.]

29,612.—P. G. McCulla, of Philadelphia, Pa., for an Improvement in Grinding Mills:

I claim the arrangement for operation together of the conical chamber, B, egg-shaped chamber, C, conical grinder, E, having scolloped or concave terminals, f, and cylinders, F G, armed with cutters, g h, in the manner and for the purposes described.

[This invention relates to certain improvements in that class of grinding mills in which a conical rotating grinder is placed within a corresponding shaped stationary shell, and which mills have crushing devices attached. The object of the invention is to facilitate the feeding or supplying of the substance to be crushed and ground to the crushing apparatus, and also to have the "dress" of the grinder and shell so formed as to insure rapid grinding and a free discharge of the ground substance.]

29,613.—Wm. Riley, Jr., of Reading, Pa,, for an Improvement in Nail Plate-feeders:

I claim, first, The arrangement of the plate box, in such a position that the plate shall be delivered from the box for reception by the nippers, by a lateral movement, to a position in front of the nippers, or between the nippers and the cutters, substantially as described.

Second, The means of operating the plate, I′, by which the nail plates are forced from the box to be received by the nippers, consisting of the pinion, J′, shaft, J, pinion, J2, toothed sector, J3, arm, J4, stud, x, rod, J5, lever, Y′, and cam, Y; the whole combined and arranged substantially as specified.

Third, The described mechanism for drawing back the nippers to withdraw the plate from the cutters, preparatory to turning it over and for feeding it up to the cutters, consisting of the oscillating friction sector, X′, the friction wheel, X2, the spur wheel, X3, and the rack, v, applied and operating substantially as described.

Fourth, The described mechanism for raising and turning the nippershaft, consisting of the plane-lifters, W4, and V2, the rod, F4, and bearing, F2, the rods, V3 and V7, the sector, R, the loose pinion, f, and its pawl, f2, and the fast-toothed collar, F5, on the nippershaft; the whole applied, arranged and operating substantially as specified.

Fifth, The combination of the chain sector, S, the sleeve, U, with its cams, V W X, and the clutch, Z; the whole applied substantially as described, upon the same rockshaft, and in connection with the carriage, E, which carries the nippers, substantially as and for the purposes specified.

Sixth, The mechanism for operating the clutch, Z, consisting of the reverse cam, T, the lever, 25, the rockshaft, 21, with its several arms, and the tappet, 28, attached to the carriage; the whole applied and combined substantially as set forth.

[This invention consists in a certain novel arrangement, in combination with the nippers of a plate-holder of a feeder for cut-nail machines, of a box from which the plates are supplied, one at a time, to the nippers by automatic mechanism. It also consists in certain means for effecting the supply of the plates from the said box at the proper time; also, in certain improved means of drawing back the nippers with the plate from the cutters, preparatory to the turning of the plate and of lifting up and turning over the nippers with the plate; also, in certain means of discharging from the nippers the fag or waste ends of the plates; also, in a certain system of mechanism for moving back and changing the movements of the carriage which carries the nippers.]

29,614.—E. H. Plant, of Plantsville, Conn., for an Improvement in Attaching Thills to Vehicles:

I claim the employment of the wedge, L, screw, e, and nut, H, in combination with the axle, A, slotted plate, G, strap, D, bar, F, and pintle, G, as shown and described, so that by depressing the wedge, E, the strap, D, with pintle, G, will be carried towards the plate, C, and the bearing of the pintle, G, between the strap, D, and the end of plate, C, will be tightened—all as set forth.

[The object of this invention is to obtain a simple means for attaching thills to axles, whereby all wear may be compensated for, or the parts readily adjusted so that they may be kept snugly in contact and the disagreeable rattling attending a looseness or play of the coupling, with the consequent wear and tear, avoided.]

29,615.—G. W. Rains, of Newburg, N. Y., for an Improvement in Steam Boilers:

I claim the combination of the upper and lower annular chambers, A B, connected by two or more series of water tubes, C C D D, the bars, F F, or other filling between the inner tubes, the curtain-like cylinder, G, and the outer casing, H—the whole arranged substantially as specified.

29,616.—G. J. Rice, of Frederick City, Md., for an Improved Sugar-grinding Mill:

I claim the arrangement and combination of two cylinder rollers having pins or projecting points on the surface of each, both revolving together at different degrees of speed, in combination with the movable bottom, J, which extends over and protects cylinder, F, from the pressing weight of the sugar and jarring mechanism, substantially as and for the purposes specified.

29,617.—O. L. Richardson, of Athens, Ga., for an Improved Curb for Millstones:

I claim the employment of a curb, C, composed of two parts, a b, the upper part, b, being provided with a flange, c, and the two parts, a, b, being separted by the interposed ribs or fans, D, leaving an air space, d, and an air escape orifice at the upper edge of the part, a, over which the edge of the part, b, projects—all as shown and described for the purpose set forth.

[The object of this invention is to obtain a simple and efficient device for admitting of the perfect ventilation of the millstones, that is to say, the admitting of a current of air through or between the stones while in operation, so as to keep the same in a cool state and thereby avoid heating the meal, consequently enabling the grinding operation to be considerably expedited.]

29,618.—Mark Rigell, of Dawson, Ga., for an Improvement in Cultivators:

I claim the combination of the spring shackle, G, and adjusting bar, E, with the beams, A A, and stocks, B B, arranged and operating in relation to each other as and for the purpose set forth.

29,619.—John Merry, of Eldorado county, Cal., for an Improved Mode of Marking Stock:

I claim the application of the owner's name with address by stamping or otherwise, and the mode of locking or securing the brand.

29,620.—Ezra Ripley, of Troy, N. Y., for an Improved Wrench and Pincers:

I claim the arrangement of the fixed and sliding wrench jaws, A B, upon one handle, C, of a pair of pincers, substantially as represented; the other handle, F, of the pincers and the sliding wrench jaw being formed to engage together substantially as herein described.

29,621.—J. K. Robinson and J. M. Clark, of Bellaire, Ohio, for an Improvement in Pistons for Steam Engines:

We claim, first, A piston composed of a series of solid disks or plates of varying diameter, united by bolts substantially as described for the purpose set forth.

Second, Perforating the bolts which hold the piston plates together substantially as and for the purpose described.

Third, Adjusting the pressure of the steam upon the packing rings by turning the screw bolts, substantially as described.

Fourth, The combination of the guard plate, I, and tongue piece, i, with the ring, when arranged substantially in the manner described.

29,622.—J. G. Rogers, of San Francisco, Cal., for an Improvement in Tool Handles:

I claim the attaching of the handle, C, to the pick, A, or other tool by means of the straps, B B, bands, D D, and the steel rod, d, placed transversely in the handle, C, and having its ends projecting from the handle and fitting in the holes, e, in the straps, substantially as described.

[This invention relates to an improved mode of attaching handles to that class of tools and implements which are generally provided with eyes to receive the handles. The object of the invention is to dispense with the use of eyes which greatly weaken the tools, and at the same time obtain a firm and durable connection, and one that will admit of a ready adjustment of the handle to the tool and its detachment therefrom.]

29,623.—Wm. Russell, of Stoughton, Mass., for an Improved Wrench and Vise:

I claim the combination of the bar, A, jaws, B C, screw, D, provided with a detachable handle, E, and the socket, F, arranged as shown to form a new and useful article of manufacture, for the purpose specified.

29,624.—W. F. Schroeder, of La Porte, Ind., for an Improvement in Seed Planters:

I claim, first, The manner of connecting and operating the spades for the purpose of regulating the depth the holes are to be dug, or to throw them out of operation when desired.

Second, The arrangement of the conducting pipes, in combination with the spades and feeding cups operated in the manner and for the purpose substantially as described.

Third, The arrangement of scrapers when connected with levers operated by the spades in the manner and for the purpose substantially as set forth.

© 1860 SCIENTIFIC AMERICAN, INC.

29,625.—John Seiberling, of Philadelphia, Pa., for an Improvement in the Preservation of Caustic Alkalies:

I claim putting up caustic potash or soda in small quantities in wooden boxes previously prepared or coated on their inner sides and subsequently sealed hermetically, substantially in the manner and for the purposes set forth and described.

29,626.—Jackson Shannon, of Dakota, Wis., for an Improvement in Culivators:

I claim the traverse bars, C C, attached to the bars, a a, as shown, and used in connection with the planks, E E, and seat, D, and the axle, G, on which the bars, a, are fitted loosely, substantially as and for the purpose set forth.

[The object of this invention is to obtain an implement which may be used as a seeding machine to plant seed either in hills or drills, and also used as an expanding cultivator; the implement operating in either capacity equally as well as if it were designed especially for each.]

29,627.—George Slusser, of Hillsboro', Ohio, for an Improvement in Animal Traps:

I claim combining the rollers, d d, with the rear portion, B, of the base frame of said trap in the manner and for the purpose set forth.

29,628.—H. T. Smith, of Washington, D. C., for an Improved Bedstead Fastening:

I claim a face-plate constructed substantially as described, with a projecting flange arranged to form a straining to the fastening key, and with a double-pointed, revolving hook arranged to enter a bolt on either side, and also with a cup projecting over and forming a guide and guard to the curved hook.

29,629.—James Smith, of Norfolk, Va., for an Improvement in Plows:

I claim the arrangement of the peculiar moldboard, C, herein described, straight-edged point or cutter, A, and inclined landside bar, B, with its movable heel piece, D, when said moldboard extends down beyond the front end of the landside bar and the curve of the same is formed by a straight line moving parallel to the edge of the cutter in the path of a cycloid, as and for the purposes set forth.

[The cutter or point of this plow has a straight edge across its whole width and a similar straight back, which latter fits into a recess at the lower end of a moldboard. The surface of the moldboard presents a curvature of the first order, being produced by the motion of a straight line parallel to the edge of the cutter in the path of a cycloid. Thus all horizontal sections of the moldboard at different hights above the ground present straight lines parallel to the edge of the cutter, and all vertical sections through the moldboard present identical cycloids parallel to each other. The most rapid curvature of this cycloidal surface is near the top of the moldboard. The landside of the plow is inclined so that the plow rests on a broad edge in front and only on one point at the heel. By this construction of plow the sod moves up gracefully over the cycloidal moldboard without being broken, it only being turned over when it arrives at the top of the moldboard. We consider this to be a most excellent plow.]

29,630.—Nathaniel Snow, of Boston, Mass., for an Improved Steering Apparatus:

I claim the arrangement of the two racks, S S′, the pinion, R, the auxiliary shaft, P, the bevel wheel, O, its pinion, N, the steering wheel shaft, K, and the slides, C C, applied to and for operating the rudder head as specified.

29,631.—M. Messer and A. Steinbrenner, of Cleveland, Ohio, for an Improvement in Hanging Sashes of Railroad Car Windows:

We claim securing the sash. E′, in railroad cars by means of the notch, N′, spring, P′, and dowels, G′, when these several parts are arranged and operated substantially as and for the purpose set forth.

29,632.—W. S. Stetson, of Baltimore, Md., for an Improvement in Harvesters:

I claim, first, Supporting the platform, a, over the axle, d, of the carriage wheels, and on the shaft, a′, by means of the uprights, b, in such manner that by withdrawing the rods, f f, and the lever pin, p′, the platform can be removed at once from the body of the machine.

Second, Combining the reversible spring lever, k, with reversible and adjusting lever, j, as set forth.

Third, So constructing the lever, J, and combining with it the axle, d, and reversible lever, h, that the said lever, j, may be readily adapted to raise and lower the cutters, whether the cutters are operating in front or in rear of the carriage wheels as set forth.

Fourth, Arranging the pawl, u, and spring, v, and ratchet, w, all within an open cylindrical rim, x, projecting inward from the hub of the driving wheel, whereby the parts are not only protected from rising dust and dirt falling from the driving wheels and disturbance from other sources, but are convenient to the driver to operate them directly with his hand without the aid of rods or levers.

Fifth, Providing the pawl, u, with a notch, z, the spring, v, and the ratchet, w, so that said parts may operate and be operated as set forth.

Sixth, Changing the position of the cutter bar from rear to front of the carriage wheels, substantially in the manner set forth.

29,633.—H. D. Stover, of New York City, for an Improved Cutter-head for Rotary Planing:

I claim, first, The conical or cone-graduating feed whereby the operator and stock are both secure when the latter is being entered to the cutters, essentially as set forth.

Second. Such graduating cone feed and revolving, adjustable guard with cutter-head, essentially in the manner and for the purposes fully set forth.

Third, Placing and clamping the cutters at an angle with and above each other essentially in the manner and for the purposes fully set forth.

Fourth, Combining a guide ring, F, with the cutter-head so that the ring shall remain stationary while the cutter-head revolves with great velocity within, when such ring and cutter-head are kept lubricated by a spiral channel in cutter-head or ring, to force the oil to every part of the working surface, essentially as set forth.

Fifth, Constructing curved grooves in collars, C and X, and imparting a corresponding reversed shape to the ends of clamp pieces, G, for securely holding them from flying out even if they should, by any reason, become loose, essentially in the manner and for the purposes fully set forth.

Sixth, Constructing the cutters, K L M and Q, and blanks, O S and U, with dovetail pieces, R P T and V, fitting to corresponding dovetail grooves formed in main part, B, to prevent the cutters or blanks from flying out under any circumstances, essentially in the manner and for the purposes fully set forth.

29,634.—A. M. Street, of Denmark, Tenn., for an Improvement in Gearing:

I claim so connecting the friction rollers to the cogs of gear wheels by means of journals and slots, or their mechanical substitutes, as that the entire pressure by which the wheel is driven shall be exerted on the circumference of the rollers which directly bear on the cogs and on the wheel itself, and that no strain shall rest on the pivots of said rollers, substantially in the manner and for the purposes described.

29,635.—J. B. Sutherland, of Detroit, Mich., for an Improvement in Sleeping Cars:

I claim the employment or use of the bearings or brackets, D D′ F F′ Q Q′, secured to the transverse partitions, E, of the car, in connection with the pins or studs, a, attached to platform, b, and the pins, b, hooks, c, and grooves, d, in the plates attached to the platform, C—all being arranged substantially as and for the purpose set forth.

[This invention relates to an arrangement of means for folding the platform berths in sleeping cars, and is designed to supersede the cast metal segmental guides hitherto used in the arrangement of seats and berths.]

29,636.—J. F. Tannehill, of Staunton, Va., for an Improvement in Seed Planters:

I claim a driving and carrying wheel provided with segments having radial arms for varying its circumference, in combination with a seed-delivering apparatus substantially such as described or its equivalent.

29,637.—W. A. Taylor and W. W. Graves, of Fort Adams, Miss., for an Improvement in Cultivators:

We claim the adjustable beams, E E, plows, d d, brace rods, b′, and the scrapers, G G, with their standard braces, b b, and the brace rods, g g—all combined and arranged in the manner herein set forth.

[This culivator is intended for loosening the soil, thinning out the plants and scraping the sides of the hills in drill husbandry. It consists in the use of a quadrangular frame capable of being adjusted laterally to adapt the machine to rows of different widths, two plows for hill plowing, attached to standards that are secured to the adjustable beams of the frame, said standards being braced to the frame in a peculiar manner, and two scrapers placed in rear of the plows and braced in a novel manner.]

29,638.—A. Threlkeld, of Boone county, Ind., for an Improved Washing Machine:

I claim the arrangement of the roller, C, on a straight line with the bottom of box, A, in combination with balls, D, and corrugated ends, E—the whole arranged on rockers, B, operating as described and for the purposes set forth.

29,639.—Nathaniel Tufts, Jr., of Boston, Mass., for an Improvement in Gas-meters:

I claim, in combination with the supplying pipe, p p, the double-headed independent bellows connected at its rear head or plate with the said pipe by a screw joint or otherwise, as set forth.

29,640.—I. C. Twining, of Wrightstown, Pa., for an Improvement in Automatic Rakes for Harvesters:

I claim, first, The arrangement of the wheels, I K G, toothed at their peripheries in sections, in connection with the bent bar, O, cam, H, and rake bar, L, attached to the upper surface of the wheel, K, substantially as and for the purpose set forth.

Second, The arrangement with the wheel, I, of the pinions, d e, cam, g, and lever, G′, and spring, c, substantially as shown, for the purpose of giving the necessary dwells or cessations of movement to the rake, as and for the purpose set forth.

[This invention relates to an improvement in that class of raking devices in which a vibrating rake is employed and arranged to sweep over the platform in the arc of a circle. It consists in a novel and improved means for operating the rake whereby the two movements necessary to be given the rake, to wit, the vibrating and the rising and falling one, may be obtained in a very simple and economical way, and the rake made to operate intermittingly when desired.]

29,641.—Wm. Van Anden, of Poughkeepsie, N. Y., for an Improvement in Machines for Cutting Files:

I claim, first, Striking a series of blows on a chisel in combination with the file blank while in a state of rest and in the same tooth, for the purposes as heretofore set forth and described.

Second, The formation of the self-adjustable chisel-holder, viz, by the combination of the shell, X′, the yielding or loose back, X2, the nut or slide, X3, the chisel, X4, spring, X5, or their equivalents, for the purposes heretofore set forth and described.

29,642.—G. W. Van Deren, of Big Flats, N. Y., for an Improvement in Steam Engines:

I claim the arrangement of the two pistons, B B′, connected by a curved piston rod, C, in the interior of the semi-circular cylinder, A, with steam passages, a a′, in the ends, constructed and operating substantially as and for the purpose set forth.

[This invention consists in arranging in the interior of a semi-circular cylinder to which steam is admitted through passages in its end, two pistons connected by a curved piston rod, so that the steam acts alternately on the two pstons with its full force, and so that an oscillating motion of said pistons is produced, which, by connecting a pin that projects from the middle of the piston rod with the crank pin of the fly wheel shaft, is converted into rotary motion.]

29,643.—Amos Whittemore of Cambridgeport, Mass., for an Improved Machine for Making Horse-shoe Nails:

I claim, first, The mode of operating the shears or cutters, the same being made to advance at the proper moment, to sever the nail from the rod and then to fall out of the way, substantially as and for the purpose described.

Second, The various parts which constitute the feeding apparatus, consisting of the upright, 5, levers, S and C, spiral spring, a, and rod, b—the whole operating in the manner and for the purpose specified.

Third, The levers, m and e, acting in conjunction to hold the rod while the nail is undergoing its formation, substantially as and for the purpose specified.

Fourth, The sliding frame, D, in combination with the chambers, H H, each being operated upon substantially as and for the purpose described.

29,644.—Ferdinand Wolf, of Brooklyn, N. Y., for an Improvement in Cultivators:

I claim, first, The roller, B, provided with teeth, a, in combination with the harrow, C, plows, D, plates, E E′, and the gearing through which motion is given to the several parts—all arranged and operating substantially as and for the purpose set forth.

Second, The combination of the plows, D, with the plates, E E′, operating so as to lay out the ground in regular hills substantially as described.

Third, The plates, E E′, operated by means of lazy-tongs, l, substantially as and for the purpose specified.

[This invention consists in arranging in a suitable framework a rotating cylinder or roller provided with teeth, for opening and pulverizing the ground, operating so as to transmit motion to the other devices. It also consists in combining a gang of plows, having a peculiar motion, with rising and falling plates for forming the hills. Also, in a peculiar device for making transverse drills, and for forming the hills in a direction opposite to that of the plows.]

29,645.—Wm. Wood, of Hartford, Conn., for an Improvement in Brick Machines:

I claim, first, The construction and arrangement of the spring lever, E, for throwing out the mold attached to the rockshaft, F, and actuated by the direct action of the arms, c, from the main shaft, D, in the manner described,

Second, The arrangement of the two levers, A and B, one for pressing down the piston and plate for filling the mold, and the other to lift up the same after the mold is filled, in the manner described, being operated by the direct action of the arms, c, from the main shaft, D, as specified.

Third, The adjusting arrangement of the slot, sliding ring and pins, G, attached to the piston rod, H, and lever, B, to regulate the pressure of the piston and press plate—all in the manner and for the purpose as set forth.

29,646.—Albert J. Allen, of Buffalo, N. Y., assignor to R. Allen, of Rock Stream, N. Y., for an Improvement in Steam Gages:

I claim, first, The combination of lever, E, with capsule, C, the said lever being so constructed and arranged as to have a bearing upon the capsule upon one side of its fulcrum, e, and a bearing upon a spring upon the other side of its fulcrum, for the purposes and substantially as described.

Second, The combination and arrangement of spring, F, with lever, E, and capsule, C, substantially as set forth.

Third, The combination and arrangement of lever, E, fulcrum block, D, capsule, C, spring, F, and stop, G, substantially as shown and described.

29,647.—A. S. Ballard (assignor to himself and Joseph Howe), of Mount Pleasant, Iowa, for an Improvement in Ditching Machines:

I claim the plow, G G′, constructed substantially as described, with or without the movable bottom, in combination with the horizontal cutters, k k k, cutters, e e, and carriage, A B—the whole being arranged and operating in the manner and for the purposes set forth.

[This invention consists in constructing a plow with an inclined bottom and furnishing it with a series of cutters and wings arranged in such a way and combined with two carriage wheels and an adjustable mechanism, that the plow will dig into the earth to any desired depth to form a ditch or trench, and elevate the earth as rapidly as it is loosened by the plow cutters, which, after being elevated to the surface (the earth) will be thrown off from each side of the ditch by the wings of the plow, and a scraper that follows in the rear of the machine.]

29,648.—F. H. Drake, of Middletown, Conn., assignor to himself and J. S. Christie, of New York City, for an Improvement in Sewing Machine Needles:

I claim making a perforating sewing machine needle substantially as described and represented.

29,649.—J. F. Flanders (assignor to himself and E. G. Allen), of Boston, Mass., for an Improvement in Leather-splitting Machines:

I claim, first, The arrangement of sectional rollers for the direct or immediate support of the hide or leather at the delivery of the same to the edge of the circulating knife, in combination with a roller located below the sectional roller and constructed as described with elastic surface and fixed bearings.

Second, Placing the sectional roll to one side of the vertical axis of the elastic roll, as described.

Third, Holding the leather and controlling its progress while passing through the machine by means of a brake operating subatntially as described.

29,650.—H. M. Jacobs (assignor to T. J. Vail), of Hartford, Conn., for an Improved Machine for Burnishing Spoons:

I claim, first, The arrangement of the burnishers, K, attached to the arms, J, the screw rod, L, connected with the burnishers by the nuts, j, the ratchet, l, pawl, N, and the rever, M, actuated substantially as shown, for the purpose of feeding the burnishers laterally across their work as described.

Second, The adjustable rod, Q, provided with springs, R R, fitted in the upright, H, having its springs, R, resting on the arm, J, of the burnishers, for the purpose of graduating the pressure of the burnishers on the bowls of the spoons, as set forth.

Third, The curved plate, S, when combined with the rod, Q, having the springs, b′ b′, attached and arranged relatively with each other as shown, for the purpose of causing the burnishers, while moving back and forth, to conform to the longitudinal profile of the bowls.

29,651.—E. A. Leland (assignor to himself and John Benson), of Brooklyn, N. Y., for a Paint Can:

I claim the construction of the can with two lips, as shown, one of which is formed into a shoulder, a, or e, to support the cover, C, while the other lip, A, composed of soft, flexible metal, is bent over upon, and made to seal the cover, C, when the latter is to be closed; but when the can is to be opened, the said lip, A, is bent up to a perpendicular position, so that the cover may be removed—all without any soldering or cutting, as and for the purpose specified.

[This invention consists in the use of a ring of some soft, flexible metal which is rigidly attached to the top edge of the can or canister and which allows of being turned over the edge of the cover in order to fasten the same down when it is desired, and which, can easily be bent back so as to free the cover whenever it is desired to open the can, without cutting any part of the cover, thus affording the means to fasten and open the can or canister manytimes, without soldering, by using the same ring and the same cover. In combination with this flexible ring the top edge of the can or canister is formed in such a manner by bending it in or by turning it inwardly over the strengthening wires, that the same forms a good shoulder for the cover to rest upon and allows the same to close down tight, to prevent any escape of the contents of the can or canister. The invention also consists in an improved mode of attaching the bale to a paint can by passing the hooked ends of the same through holes in the side of the can, which holes are covered up and protected from the inside by a plate which is soldered over the same, thereby affording a simple, good and substantial hold to the bale, without allowing the contents of the can to escape.]

29,652.—D. F. Maltby (assignor to the Waterbury Button Company), of Waterbury, Conn., for a Photographic Medal:

I claim the article which I have described and termed a "photographic medal," composed of a ring or plate of solid metal, constituting a frame or rim of a medallic character surrounding one or more pictures produced by photography.

29,653.—Aaron Miller (assignor to himself, G. B. Whiteside, G. F. Barnett and J. M. Lane), of Brockport, N. Y., for an Improvement in Corn Planters:

I claim the arrangement of the slide, V, rollers, F, levers, a r j j rods, c c d d, and wheel, E, as described and for the purposes specified.

29,654.—Bradford Stetson, of Uxbridge, Mass., assignor to himself and Elmer Townsend, of Boston, Mass., for an Improvement in Turbine Water Wheels:

I claim arranging the slotted plate, E, and its shaft, C, with the wheel, A, and its shaft, B, joining the two shafts, B and C, by the disks, m n, and screw, o, connected as described, and applying the plate, E, to the buckets and the latter to the wheel heads, as specified.

RE-ISSUE.

E. H. Ashcroft, of Boston, Mass., for an Improvement in Apparatuses for Naphthalizing Gases. Patented June 5, 1860

I claim the above-specified arrangement and application of the float, scroll and disk, whereby they are rendered capable of easy and proper adjustment as explained.

Also, the combination of one or more propelling wings or the equivalent thereof, with the scroll and float, when applied and used with

© 1860 SCIENTIFIC AMERICAN, INC.

in a cistern substantially in manner and for the purpose as described—such propelling devices being to facilitate or effect the rotation of the said float and scroll while buoyed within the liquid as described.

Also, the application and arrangement of the foraminous diaphragm with respect to the cistern and eduction pipe of the apparatus as described.

ADDITIONAL IMPROVEMENT.

Alburtus Geiger, of Dayton, Ohio, for an Improvement in Lamps. Patented May 29, 1860:

I claim, first, Expanding the lower portion of the wick tube into a chamber or reservoir for the reception of the fluid as it flows through valve, E, thereby securing a more steady and regular supply to the wick and also preventing the fluid from being vaporized too far from the burner.

Second, The combination of the chamber, H, with the wick tube, C, and heaters, A A—all being arranged substantially as and for the purposes specified.

DESIGN.

J. P. Cunningham, of Franklin, Tenn., for a Design for Coffins.

Notes and Queries

CORRESPONDENTS sending communications for publication in our columns are requested to avoid writing on both sides of a sheet of paper. This fault, though common to persons unaccustomed to writing for the press, gives great trouble to the printer (especially in long articles), and, when combined with illegibility of handwriting, often causes interesting contributions to be regretfully consigned to our waste-paper basket.

C. W. S., of Conn.—You will find the philosophy of the dew explained on page 338, Vol. I. (new series), SCIENTIFIC AMERICAN. It neither rises nor falls; but is condensed from the moisture in the atmosphere.

S. B., of Minn.—Your description of the meteor is very intersting from your locality; and, as we have decided to give the subject no more space in our paper, we shall hand your letter to Professor Mitchell.

SKILLFUL CHEMIST, of Ind.—It is so uncertain whether the cattle epidemic in Massachusetts is the same as the disease which you have treated so successfully, that we shall hardly make room for your communication.

H. H. G., of N. Y., and R. W., of ———.—Your communications on the sugar-light are received. We think Mr. Root's communication exhausted the subject.

B., of Conn.—We refer you to page 110 of the current volume.

C. D., of Mass.—For high-pressure engines, the cylinders have to be:—For 2-horse powers, 6.5 by 17 inches; for 2-horse powers, 7.5 by 19.5 inches; for 4-horse powers, 8.5 by 22 inches; for 5-horse powers, 9.1 by 23.5 inches; for 6-horse powers, 9.8 by 25 inches.

J. H., of Ill.—The article on coal oils to which you refer was translated literally from "Le Génie Industriel." We thought, at the time, that we should like to know the particulars about which you inquire; but we know of no way of ascertaining them.

A. L. C., of Mass.—Your interesting description of the meteor is received.

R. H., of ———.—We do not believe that the composition you describe will make a coating (for buildings) which will not crack. We know of none that will. We have had roofs made of coal tar, asphaltum, &c., that were perfectly tight, and entirely satisfactory in every respect.

T. L. B., of Ill.—A circular saw used for sawing firewood takes more power than there is in a man's muscles to drive it constantly for any considerable time. It needs horse, steam or water-power. Belts are better than gearing for driving circular saws.

C. H. W., of Conn.—A gear wheel might be suspended between two others without bearings, except upon the cogs.

N. C., of Ala.—You will see that Giles' "compensating pendulum" was disposed of on page 99 of the present volume of our paper.

D. S., of Pa.—Your description of the appearance of the meteor is received, and seems to confirm the general opinion in regard to it. A great mass of iron, nickel, &c., rushing through the air with a velocity of 20 miles per second, would have its surface heated by the condensation of the air; and this heated surface would be apt to fly off in scales which would fall to the ground.

W. T. G., of Conn.—We perfectly agree with you that atmospheric electricity is generally positive, and that the discharges are almost always downwards. There are some instances on record of upward discharges having taken place; but they are very rare, indeed.

R. F., of N. Y.—Smee's battery is about the best which you can use for electro-plating; and his work on the subject, published by J. Wiley, Walker-street, this city, will afford you the instruction desired to conduct the operations.

J. H., of Pa.—Of course, if the handle of a screwdriver can be held at an angle with the screw, so as to swing around the line of the latter, the longer the handle, the greater the leverage.

J. F. F., of ———.—A compression of air equal to four-fifths of its volume is sufficient to ignite tinder.

W. S. T., of N. Y.—As long as your first inventions proved so valuable in the hands of others, you ought to be able, with proper effort, to find some one among your acquaintances to take hold of the others which you have in store, provided they are really good ones.

MONEY RECEIVED

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, August 18, 1860:—

C. S., of Pa., $30; D. F. D., of Ind., $55; A. A. R., of Mass., $25; G. R. B., of Pa., $35; C. P. G., of Ill., $25. J. C., of Iowa, $30; W. D., of N. Y., $30; G. H. & S. F., of N. Y., $25; P. H. S., of Cal., $55; W. T. O., of Ga., $25; D. F. E., of Mass., $15; L. W. T., of Minn., $25; J. G. P., of Austria, $350; W. T. D., of N. Y., $55; S. & H., of N. Y., $10; J. P., of N. Y., $30; B. P., of Ga., $25; C. W. F., of N. Y., $30; I. F., of Va., $25; A. B., of N. Y., $25; A. & C., of Mo., $35; J. R. S., of Fla., $25; E. D. D., of Conn., $60; D. F., of Pa., $37; G. I. C., of Vt., $30; W. H. H., of Ala., $30; S. C., of Ga., $30; J. T. H., of Miss., $12; A. & G., of N. Y., $25; L. A. B., of N. Y., $25; J. W. H., of N. Y., $25; R. & E., of Wis., $150; F. H. W., of Cal., $57; M. L. C., of N. Y., $33; N. S. M., of Conn., $10; S. R. W., of R. I., $25; L. W., of Mass., $25; C. A. R., of Ala., $75; J. B., of N. Y., $15; W. D., of N. Y., $25; G. W. S., of Conn., $25; B. S. P., of Ga., $25; J. J. M., of Conn., $25; W. S., of Wis., $25; P. C., of N. Y., $25; W. McI., of Ill., $30; C. & G., of Mass., $12; J. H. H., of Ky., $30; L. L. A., of Mo., $20; J. B. D., of N. Y., $50; S. C. W., of Conn., $30; W. D. M., of Va., $25; M. S. C., of N. Y., $33; S. H., of L. I., $15; H. L. N., of N. Y., $30; T. E. C. B., of Ky., $50; J. H. L., of Ky., $30; J. M. T., of Va., $30; I. P., of N. Y., $30.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, August 18, 1860:—

G. W. S., of Conn.; T. H., of Cal.; M. C. B., of Ill.; F. E. M., of N. Y.; P. & R., of Mo.; G. H. & S. F., of N. Y.; F. J., of Ill.; Van A. & L., of N. Y.; J. C., of La.; L. A. B., of N. Y.; M. L. C., of N. Y.; W. D. M., of Va.; B. & M., of N. Y.; T. E. C. B., of Ky. (two cases); W. D., of N. Y.; A. & C., of Mo.; A. A. R., of Mass.; S. C., of Ga.; C. P. G., of Ill.; D. F., of Pa. (two cases); E. D. A., of Ala.; G. H., of Conn.; O. P. A., of N. H.; J. R., of N. Y.; J. H. LaB., of N. Y.; C. & G., of Mass.; B. P., of Ga.; C. A. R., of Ala. (two cases); S. R. W., of R. I.; P. N. B., of N. Y.; R. E. H., of Conn.; A. & G., of N. Y.; W. S., of Wis.; J. F. H., of Maine; J. J. M., of Conn.; L. W. T., of Minn.; B. S., P., of Ga.; J. B. D., of N. Y. (two cases); W. T. O., of Ga.; I. K. S., of Fla.; G. R. B., of Pa.; S. H., of N. Y.; A. B., of N. Y.; I. F., of Va.

IMPORTANT TO INVENTORS.

THE GREAT AMERICAN AND FOREIGN PATENT AGENCY.—Messrs. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN, are happy to announce the engagement of HON. CHARLES MASON, formerly Commissioner of Patents, as associate counsel with them in the prosecution of their extensive patent business. This connection renders their facilities still more ample than they have ever previously been for procuring Letters Patent, and attending to the various other departments of business pertaining to patents, such as Extensions, Appeals before the United States Court, Interferences, Opinions relative to Infringements, &c., &c. The long experience Messrs. MUNN & Co. have had in preparing Specifications and Drawings, extending over a period of fifteen years, has rendered them perfectly conversant with the mode of doing business at the United States Patent Office, and with the greater part of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between NINE and FOUR o'clock, daily, at their PRINCIPAL OFFICE, No. 37 PARK ROW, NEW YORK. We have also established a BRANCH OFFICE in the CITY OF WASHINGTON, on the CORNER OF F AND SEVENTH-STREETS, opposite the United States Patent Office. This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington, having business at the Patent Office, are cordially invited to call at their office.

They are very extensively engaged in the preparation and securing of Patents in the various European countries. For the transaction of this business they have Offices at Nos. 66 Chancery Lane, London; 29 Boulevard St. Martin, Paris, and 26 Rue des Eperonniers, Brussels. We think we may safely say that three-fourths of all the European Patents secured to American citizens are procured through our Agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

A pamphlet of information concerning the proper course to be pursued in obtaining patents through their Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the Principal Office or either of the Branches. They also furnish a Circular of Information about Foreign Patents.

The annexed letters, from the last three Commissioners of Patents, we commend to the perusal of all persons interested in obtaining Patents:—

Messrs. MUNN & Co.:—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill and fidelity to the interests of your employers. Yours, very truly,

CHAS. MASON.

Immediately after the appointment of Mr. Holt to the office of Postmaster-General of the United States, he addressed to us the subjoined very gratifying testimonial:—

Messrs. MUNN & Co.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you have discharged your duties of Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and, I doubt not, justly deserved) the reputation of energy, marked ability and uncompromising fidelity in performing your professional engagements. Very respectfully,

Your obedient servant, J. HOLT.

Messrs. MUNN & Co.:—Gentlemen: It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency, and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully,

Your obedient servant, WM. D. BISHOP.

Communications and remittances should be addressed to

MUNN & CO.,
Publishers, No. 37 Park-row, New York.

MACHINE-SHOP FOR SALE—HAVING AN excellent assortment of Tools, suitable for any light machinery; will be sold very low. Address MACHINE, Box No. 127 New York Herald office. 1*

STEVENSON'S JONVAL TURBINE WATER Wheels, which gave a useful effect of .9077 per cent of the power employed at the late trial of Water Wheels at the Fairmount Works, Philadelphia, March 9, 1860, are manufactured by J. E. STEVENSON, Novelty Iron-works, New York. 8 2*

COTTON MILL FOR SALE.—WILL BE SOLD to the highest bidder, at Spiller's auction-rooms, in the city of Tuskaloosa, in the State of Alabama, on MONDAY, the 3d day of September next, the Mill and Machinery, Supplies, &c., belonging to the Tuskaloosa and North Port Manufacturing Company. This property consists of about 10 acres of Land, situated on the bank of the Warrior river and near the contemplated depot of the Northeast and Southwest Alabama Railroad, on which is the Mill (a 4-story building, exclusive of basement), 150x50 feet, substantially built of brick; attached to which are rooms for English Boilers, Machine-shop, Picker and Lap-rooms and room for Wool-carding. There are also on the premises a Blacksmith-shop, Dye-house, Office, Warehouse, and 12 Tenements for operatives (all of brick), besides 2 framed operatives' Houses. The machinery is as follows, viz:—A double Steam Engine, 15-inch cylinder, 5 feet stroke, with 3 new Boilers, 30 feet long with 15-inch flues; 1 Picker, 4 Lap-spreaders, 2 pairs Scales, 42 Cards, 30 inches; 6 Railway-heads and Drawing, 5 Drawing Frames, 3 heads each; 7 geared Spreaders, 24 spindles each; 2 fine Spreaders, 54 spindles each; 2 Card-grinders, 1 Bobbin-winder, 12 Ring Spinning Frames, 128 spindles each; 18 Dead Spinning Frames (2 spoolers), 64 spindles each; 4 Dressing Frames, 4 Section Warpers, 1 Beamer, 2 Warping-mills, 1 Wool Mule, 300 spindles; 1 single 48-inch Breaker Card, 1 single 36-inch Finisher Card, 1 Wool-picker, 1 Burring machine, 1 Grinder, 80 Looms, 1 large Engine Lathe, 1 Lathe, 6 feet; 1 Hand Lathe, 1 Gear-cutter, 1 Screw-cutter, 1 lot Dies and Taps, 1 set Smiths' Tools, 1 Circular Saw, 1 Watch Clock, 2 small Clocks, 1 Cloth and 2 Thread Presses, 2 Platform Scales, lot of Dyestuffs and supplies, with other things too tedious to mention. The above property, until the day named, is offered at private sale for the sum of $25,000, one-fourth the purchase money cash, the balance in three equal annual installments, with 8 per cent interest from date and satisfactory security. If not sold before the day of sale, it will then be offered on the above terms, at a minimum of $20,000. B. JEMISON, Jr.,
1* President Tuskaloosa and North Port Manufacturing Co.

PLANING-MILL MACHINERY FOR SALE.—Having sold the real estate occupied by my Planing and Sawmills at Albany, N. Y., I now offer for sale all the Machinery (at low prices and in lots to suit purchasers), consisting of 1 horizontal 80-horse Steam Engine, 2 Steam Boilers, 24 feet long by 4 feet diameter, 2 18-inch flues each; also, 3 Steam Boilers, 22 feet long by 3 feet diameter—2 flues each; 6 superior Woodworth Planing Machines, various sizes; 2 upright re-splitting Sawmills; 1 large Circular Sawmill for re-splitting—cuts 16 inches wide; 1 Crosby Clapboard Saw; also, Circular Saw Benches, Line Shafting, 3 to 5 inches; Pulleys, 2 to 4 feet diameter; 1 10-foot Iron-planer, for metals (nearly new); 1 14 screw-cutting Engine Lathe, swings 25 inches; 3 double Lumber Trucks, together with all the Belting, Tools, &c. Address JOHN GIBSON, Planing Mills, Albany, N. Y. 1*

McALLISTERS' PRICED AND DESCRIPTIVE Catalogue (120 pages, 200 illustrations) of Optical, Mathematical and Philosopical Instruments furnished gratis, and mailed free of charge to all parts of the United States. Contents:—Magic Lanterns, Microscopes, Spy-glasses, Barometers, Telescopes, Tape-measurers, Mathematical Instruments, Air Pumps, Hygrometers, Galvanic Batteries, Globes, Hydrometers, Thermometers, Surveyors' Compasses, Surveying Chains, Camera Obscuras, Camera Lucidas, Spectacles, &c., &c., &c. McALLISTER & BROTHER,
(Established in 1796) No. 728 Chestnut-street,
1* Philadelphia, Pa.

STUMP-EXTRACTOR WANTED.—PARTIES having such machines for sale will please address JOHN B. ROBERTSON, Centerville, La., stating price, &c., with description of machine. 9 3*

THRESHING AND CLEANING MACHINES.—The subscriber can furnish and ship to any place these Machines; will send particulars, on application. Also, can furnish native Wines, fermented or sweet. Can refer to the principal tobacco factors East and in New Orleans; will give special reference, if required. Address W. M. ARMSTRONG, Ripley, Ohio. 1*

FOR 30 CENTS, I WILL SEND PRINTED DIrections for drawing Scrolls with common compasses.
1* A. BELCHAMBERS, Ripley, Ohio.

IMPORTANT TO INVENTORS.—SEND $1, AND get, by return mail, "Preston's Inventors' Suggestive Catalogue," containing a great variety of useful articles. Please address M. P. PRESTON, Box 409 P. O., Trenton, N. J. 9 2*

SATINET FINISHER WANTED—FOR A MILL in Philadelphia; none but those who have had good experince on satinets, and who can bring proofs of perfect sobriety, need apply. To a first-class, sober Finisher, very liberal wages will be given. Address, with particulars and references, JAMES K. BENTON (care of Little, Stokes & Co.), No. 237 Chestnut-street, Philadelphia, Pa. 9 3*

END-PRESSURE MACHINES AND RIGHTS TO use, for every variety of wood-bending; prices range from $250 upwards. Builders, Lane & Bodley; patentee, JOHN C MORRIS, Cincinnati, Ohio. 9 8*

UNITED STATES PATENTS OF MERIT SOLD on commission; consignments solicited for the Massachusetts State Fair; 100,000 visitors expected. For extended information, address (with stamp) SPENCE & CO., Patent Agents, No. 86 Court-street, corner of Howard, Boston, Mass. 9 2*

IRA HART'S THRESHER AND CLEANER (just patented) is the most rapid, best, simplest and cheapest ever invented. It has three shafts and three small cog-wheels, and is without a pulley, belt, cord, elevator or conveyor; has been thoroughly tested. For particulars, address IRA HART, Clarksburgh, Va. 1*

LABORATORY OF CHEMISTRY.—CONSULTAtions on Chemistry applied to Arts and Manufactures, Agriculture, Metallurgy, Mining Surveys; Analyses of Ores, Manures, Guano, &c.; information on Chemical Fabrications, with drawings, such as Colors, Varnishes, Gas, Coal Oils, Paper, Candles, Soaps, Dyeing, Animal Black, Manures, Acids, Alkalies, Salts, India-rubber, Gutta-percha, &c., &c. Address—
Professor H. DUSSAUCE, Chemist,
(From the Conservatoire Imperial of Arts and Manufrs, Paris),
9 2* New Lebanon, N. Y.

J. A. FAY & CO., WORCESTER, MASS., MAKE the Radius Planer and Machine Spoke-shave, for crooked work and cross-grained lumber. It will chamfer, round, butt and smooth irregular and plane surfaces. Send for circulars. 9 2*

WANTED—TO GO SOUTH, IN A HEALTHY location, a SMITH, of steady habits and with experience in Forging and Tool-dressing, for a machine-shop of general work. To a competent person, a steady situation, at $2.25 per day, is offered. Address R. NICKERSON, Agent, Athens, Ga. 1*

BALL'S OHIO MOWERS AND REAPERS—Surpassed by none; covered by 40 patent claims. Manufacturers wanted for the unoccupied territory.
9 4* ROFF & SAXTON, Canton, Ohio.

THE ADVERTISER HAVING A SEWING-MACHINE shop, wishes to meet a person with sufficient capital to take an interest in and extend the sale of a very simple and durable Machine, which will meet a ready sale. Address MACHINE, Box No. 127 New York Herald office. 1*

PATEE & RYAN'S SOLDERING-IRON—PATented July 3, 1860. State and county rights for sale. Apply to LESTER PATEE, Peoria, Ill., or to A. H. RYAN, No. 1,024 Broadway, New York. 8 3*

© 1860 SCIENTIFIC AMERICAN, INC.

THE THIRTEENTH ANNUAL EXHIBITION OF the works of American Industry, by the Maryland Institute, will be opened in the city of Baltimore on Tuesday evening, October 9, 1860. Manufacturers, Mechanics, Artists, Inventors and others are most cordially invited to contribute to this exhibition. The utmost care will be exercised by the managers to make this exhibition both pleasant and profitable to the exhibitors, and especial attention will be given to the selection of judges, so as to insure complete justice in the distribution of awards and premiums, which will consist of Gold and Silver Medals, Silverware, Jewelry, &c., &c. Freights on machinery, by steamboat, from New York, Boston or Philadelphia will be free, or settled by the Institute; and if the owner is not present, by forwarding the bills of lading to the Chairman of the Committee, the goods will receive his personal attention in fitting-up and arranging the same for exhibition. From the success of our former exhibitions, the facilities and convenience offered at this exhibition, together with the central location of our city between North and South, gives us reason to believe that we shall be able to offer greater inducements to manufacturers, mechanics, artists, inventors and others to exhibit at this Fair than has ever been offered at any similar exhibition in this country. Circulars, containing regulations and arrangements, will be promptly furnished, on application to the Committee or JOHN S. SELBY, Actuary of the Institute. E. WHITMAN,
8 4* Chairman of Committee on Exhibition.

THE GRAEFENBERG THEORY AND PRACTICE OF MEDICINE.—On the 1st day of May, 1860, the Graefenberg Company's Sales-rooms, Consulting Offices and Medical Institute were removed from No. 34 Park-row to—
No. 2 Bond-street, New York,
(first door from Broadway,) in order to afford greater facilities and a more central location, demanded by the rapid increase of confidence in the Graefenberg Theory and Practice. The Graefenberg Theory and Practice, and the use of their medicines, together with complete symptoms of all diseases incident to this country and climate, the best method for their prevention and cure, will be found in the "Graefenberg Manual of Health."
This valuable family medical work, containing 300 pages, has been revised and improved, and elegantly illustrated with beautifully colored engravings of the human system. Sent by mail to any part of the country, on receipt of 25 cents. It is a complete guide to all diseases and their cure. Address
JOSHUA F. BRIDGE, M. D.,
Resident and Consulting Physician Graefenberg Co.,
No. 2 Bond-street, New York.
One of the leading journals says of the Graefenberg Manual of Health:—"This is the only medical book for family and general use ever published. It is written in plain language, free from scientific terms, and condenses more practical medical information than can be obtained anywhere else, unless a regular medical course of education is undergone. The popularity of this admirable and compendious work is well shown by this being the twenty-fourth edition. It contains a number of colored anatomical plates, and is a complete family physician. It is at once simple, popular, plain and explicit; and the mother, with such an adviser, is prepared at once to apply the proper remedies in case of sudden sickness in the family. In the country, a copy of the 'Manual of Health' is indispensable, and every family should possess one. It will save a hundred times its cost in doctors' bills, and, what is far better, will be the means of preserving many valuable lives to their families and relatives."
1eowtf

$1.200 A YEAR MADE BY ANY ONE with A. J. Fullam's patent $10 outfit of stencil tools, with stock enough included to retail for over $100. Silver medal awarded. Samples free. Address—
5 4*eow A. J. FULLAM, No. 212 Broadway, New York.

HARRISON'S GRIST MILLS—20, 30, 36 AND 48 inches diameter, at $100, $300, $300 and $400, with all the modern improvements. Also, Portable and Stationary Steam-engines of all sizes, suitable for said Mills. Also, Bolters, Elevators, Belting, &c. Apply to S. C. HILLS, No. 12 Platt-street, New York. 1 e3w

WHEELER & WILSON MANUFACTURING Company Sewing Machines. Office, No. 505 Broadway, New York. Send for a pamphlet. 5 8*

FOR SALE—TWO LARGE TRIP HAMMERS; one new and one second-hand (as good as new). For full description see advertisement in SCIENTIFIC AMERICAN.
3 12* J. C. HOADLEY, Lawrence, Mass.

FOR SALE—A STATIONARY STEAM ENGINE, 7x15, 10-horse power, with boiler and all appurtenances; has been in use three months; in perfect order. An excellent engine. Particulars on application. J. C. HOADLEY, Lawrence, Mass.
3 13*

FOR SALE—A DOUBLE HORIZONTAL STEAM engine, 18x36, 100-horse power; has been in use one year; in perfect order. Three boilers and all appurtenances. Particulars on application. [3 13*] J. C. HOADLEY, Lawrence, Mass.

STEPHENS' DYES FOR WOOD—IMITATING black walnut, mahogany, satinwood, rosewood or oak. Specimens sent on receipt of 15 cents. C. J. REILLY, No. 70 William-street, New York. 3 10*

TO CHAIR, CABINET-MAKERS AND BOAT-BUILDERS.—Rights to use Blanchard's patent in the States of New York, New Jersey, Pennsylvania and Maryland, for sale by the Phœnix Wood-bending Company. JOHN SILSBY, Agent,
6 4* No. 34 Broadway, New York, up stairs.

BARREL HEAD-CUTTERS, PLANERS AND wheel-jointers for sale at the Greenwood Patent Barrel Machine Works, Rochester, N. Y. [7 8*] JNO. GREENWOOD.

STATE AND COUNTY RIGHTS OF J. H. Gooch's universal plow for sale. See illustration and description on page 406, Vol. II. (new series), of the SCIENTIFIC AMERICAN. For further information, address the inventor, J. H. GOOCH, Oxford, N. C. 7 5*

SCRUBBING BRUSHES, FLESH BRUSHES, Hand Brushes, Nail Brushes, &c.—For a good valuable article, see illustration on page 400, last volume of the SCIENTIFIC AMERICAN.
2 3

PORTABLE STEAM ENGINES—6, 8 AND 10-horse, at $500, $625 and $780. For sale by S. C. HILLS, No. 12 Platt-street, New York. 1 e3w

FOR SALE—ONE FIRST-CLASS SECOND-hand Steam Engine, 25-horse power, with patent Cut-off, together with Boiler and Fixtures. BLAKE & SON,
8 4* Albany, N. Y.

PROFESSOR HORSFORD'S PATENT SUBSTITUTE FOR CREAM-OF-TARTAR.—This invaluable article, for cooking purposes, may be obtained of our regular agents, in any quantity, at established and uniform prices, proportioned to the amount purchased. In New York, of Messrs. Sackett, Belcher & Co., Nos. 28 and 30 Reade-street; in Boston, of Messrs. Dana, Farrar & Hyde, No. 83 Broad-street; and in Philadelphia, of Messrs. Burgin & Sons, No. 132 Arch-street. GEO. F. WILSON,
Treasurer Rumford Chemical Works, Providence, R. I.
8 4

INVENTORS' DEPOT AND SALESROOMS FOR Patent Rights, No. 30 Broadway, New York.—Patents possessing positive merits—and such only—have, in this depot, their headquarters, where they can be properly introduced to public notice and find purchasers. Constant opportunities for judicious and profitable investments in patents, embracing all departments in life, can here be found by parties of liberal as well as of limited means. Citizens and strangers, all, can find something to interest and profit them, and they are cordially invited to call at our depot; the latch-string being out. Circulars, descriptive of the objects of the agency, can be had on application. BUTLER, HOSFORD & CO.
6 tf

WOODWORTH PLANING MACHINES FROM $80 to $150.—Sash-molding, tenoning and mortising machines at low prices. For sale at the Philadelphia Machinery Depot, No. 135 North Third-street. [1 13*] CHAS. H. SMITH.

VALUABLE IMPROVEMENT IN PROPELLER Ships—Patented March 27, 1860. For engraving and description, see SCIENTIFIC AMERICAN, Vol. II., No. 23 (June 2, 1860). The use of this patent right may be had, on very liberal terms, by an arrangement with the patentee. Address H. W. HERBERT, Norfolk, Va. 6 4*

GREAT CURIOSITY.—PARTICULARS SENT free. Agents wanted. SHAW & CLARK,
6 24* Biddeford, Maine.

THE EIGHTEENTH EXHIBITION OF ARTS and Manufactures, under the direction of the Ohio Mechanics' Institute, will open in Cincinnati on Monday, Sept. 10th, and continue open four weeks. The premiums will consist of more than 100 gold and silver medals, &c. Send for circular. 7 5*

WEST TROY BELL FOUNDRY (ESTABLISHED in 1826).—The subscribers manufacture, and have constantly for sale at their old-established foundry, their superior Bells for churches, academies, factories, steamboats, locomotives, plantations, &c., mounted in the most approved and substantial manner, with their new patented Yoke and other improved mountings, and warranted in every particular. For information in regard to keys, dimensions, mountings, warrantee, &c., send for a circular. Address A. MENEELY'S SONS, West Troy, N. Y. 8 6

CHARLES A. SEELY, CHEMIST, NO. 424 Broadway, New York.—Analyses of ores, minerals, articles of commerce, &c. Advice and instruction in chemical processes generally; advice on chemical patents. 1*

J. R. STAFFORD'S OLIVE TAR.—WHEN Olive Tar is inhaled, its healing balsamic odors are brought in direct contact with the lining membranes of the Throat, Bronchial Tubes and all the air cells of the Lungs, relieving at once any pain or oppression, and healing any irritation or inflammation; when Olive Tar is taken upon sugar, it forms an unequaled soothing and healing sirup for Coughs and all Throat Diseases; when Olive Tar is applied, its magnetic or concentrated curative powers render it a most speedy and efficient PAIN ANNIHILATOR. Olive Tar is not sticky—does not discolor. Fifty cents a bottle, at No. 442 Broadway, New York, and by all druggists.
J. R. Stafford's IRON AND SULPHUR POWDERS are a soluble preparation of iron and sulphur, identical with that existing in the blood of a perfectly healthy person. Uniting with the digested food, they Re-vitalize and Purify the Blood; they impart Energy to the Nervous System; they Invigorate the Liver; they Strengthen the Digestion; they Regulate the Secretions of the Body, and are a Specific for all Female Weaknesses. Price $1 a package, at No. 442 Broadway, New York, and all druggists. 8

STEAM AND WATER GAGES, GLASS TUBES, Indicators, &c., constantly on hand at maker's prices. E. BROWN, No. 311 Walnut-street, Philadelphia, Pa. 7 3*

IMPORTANT TO MECHANICS.—THE VARIETY MOLDING MACHINE.—This machine is a combination of six patents, and superior to all others for shaping, planing and molding irregular forms; also straight molding and planing. It is simple and safe to the operator. See illustration on page 329, Vol. I., of the SCIENTIFIC AMERICAN. Send for circular. Address S. M. HAMILTON, Baltimore, Md. 1 13*

BURNHAM'S IMPROVED JOUVAL TURBINE water wheel (patented Feb. 22, 1859) and mill gearing of the latest improved patterns. Manufactured by N. F. BURNHAM, Variety Iron-works, York, Pa. 1 13*

FOX'S "EXCELSIOR" CRACKER MACHINE—Patented Feb. 1, 1859, can be seen in full operation at his extensive bakery at Lansingburg, N. Y., doing the work of 90 men, with only 10 operatives employed in this large establishment. The machine has also been patented in England, France and Belgium, Territorial rights are offered for sale. For further particulars, please address Ira Jagger, at Albany, N. Y., who is agent for the sale of machines and territorial rights. [25 13] JOSEPH FOX.

READY THIS DAY.—NEW EDITION, REvised and Enlarged.—"Wells' Every Man his Own Lawyer and United States Form Book." A complete and reliable guide to all matters of business negotiations for every State in the Union, containing simple instructions to enable all classes to transact their business in a legal way without legal assistance. Also, containing the laws of the various States and Territories concerning the Collection of Debts, Property Exempt from Execution, Lien Laws, Laws of Limitation, Laws of Contract, Legal Rates of Interest, License to Sell Goods, Qualifications of Voters, &c., &c. ☞ No man or business woman should be without this work; it will save many times its cost, much perplexity and loss of time. 12mo., 408 pages, law binding; price $1. Sent postpaid. Agents wanted for this and other popular publications. Address JOHN G. WELLS, Publisher, corner of Park-row and Beekman-streets, New York. 25 tf

KNITTING MACHINES.—J. B. AIKEN'S power, ribbed and plain knitting machines for factory use; winders, bobbins, &c., furnished at short notice. For pamphlet descriptive of machines, address Aiken Knitting Machine Co., No. 429 Broadway, New York. 22 13

PORTABLE STEAM ENGINES, COMBINING the maximum of efficiency, durability and economy with the minimum of weight and price. They received the large gold medal of the American Institute, at their late fair, as "the best Portable Steam Engine." Descriptive circulars sent on application. Address J. C. HOADLEY, Lawrence, Ma. 1 22*

PUMPS! PUMPS!! PUMPS!!!—CARY'S IMproved Rotary Force Pump, unrivaled for pumping hot or cold liquids. Manufactured and sold by CARY & BRAINERD, Brockport, N. Y. Also, sold by J. C. CARY, No. 2 Astor House, New York City. 23 13

Zur Beachtung für Erfinder.

Erfinder, welche nicht mit der englischen Sprache bekannt sind, können ihre Mittheilungen in der deutschen Sprache machen. Skizzen von Erfindungen mit kurzen, deutlich geschriebenen Beschreibungen beliebe man zu adressiren an

Munn & Co.,
37 Park Row, New-York.

Auf der Office wird deutsch gesprochen.

OIL! OIL! OIL!—FOR RAILROADS, STEAMers, and for Machinery and Burning. Pease's Improved Machinery and Burning Oil will save fifty per cent., and will not gum. This Oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough and practical test. Our most skillful engineers and machinists pronounce it superior to and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The SCIENTIFIC AMERICAN, after several tests, pronounces it "superior to any other they have ever used for machinery." For sale only by the Inventor and Manufacturer, F. S. PEASE,
No. 61 Main-street, Buffalo, N. Y.
N. B.—Reliable orders filled for any part of the United States and Europe. 1 13

MAPES' AGRICULTURAL IMPLEMENT AND Seed Warehouse, Wholesale and Retail. All improved and standard varieties of Agricultural Machinery and Implements. Orders from correspondents promptly attended to, and special attention given to low contracts for freight. CHARLES V. MAPES,
24 tf 128 and 130 Nassau and 11 Beekman-streets, New York.

NEW SHINGLE MACHINE—THAT WILL RIVE and Shave 24,000 Shingles in a day, for sale by
1 tf S. C. HILLS, No. 12 Platt-street, New York.

MACHINE BELTING, STEAM PACKING, ENGINE HOSE.—The superiority of these articles, manufactured of vulcanized rubber, is established. Every belt will be warranted superior to leather, at one-third less price. The Steam Packing is made in every variety, and warranted to stand 300 degs. of heat. The Hose never needs oiling, and is warranted to stand any required pressure; together with all varieties of rubber adapted to mechanical purposes. Directions, prices, &c., can be obtained by mail or otherwise at our warehouse. NEW YORK BELTING AND PACKING COMPANY. JOHN H. CHEEVER, Treasurer,
1 13 Nos. 37 and 38 Park-row, New York.

WROUGHT IRON PIPE, FROM ONE-EIGHTH of an inch to six inches bore; Galvanized Iron Pipe, (a substitute for lead,) Steam Whistles, Stop Valves and Cocks, and a great variety of Fittings and Fixtures for Steam, Gas, and Water, sold at wholesale and retail. Store and Manufactory, No. 76 John-street, and Nos. 29, 31 and 33 Platt-street, New York.
1 13 JAMES O. MORSE & CO.

WOODWORTH PLANERS—IRON FRAMES TO plane 18 to 24 inches wide, at $90 to $110. For sale by S. C. HILLS, No. 12 Platt-street, New York. 1 tf

GUILD & GARRISON'S STEAM PUMPS FOR all kinds of independent Steam Pumping, for sale at 55 and 57 First-street, Williamsburgh, L. I., and 74 Beekman-street, New York.
1 13 GUILD, GARRISON & CO.

IRON PLANERS, ENGINE LATHES, AND OTHER Machinists' Tools, of superior quality, on hand and finishing, and for sale low; also Harrison's Grain Mills. For descriptive circular, address New Haven Manufacturing Co., New Haven, Conn. 1 13

BOILER FLUES FROM 1¼ INCH TO 7 INCHES outside diameter, cut to any length desired, promptly furnished by JAMES O. MORSE & CO.,
1 13 No. 76 John-street, New York.

SOLID EMERY VULCANITE.—WE ARE NOW manufacturing wheels of this remarkable substance for cutting, grinding and polishing metals, that will outwear hundreds of the kind commonly used, and will do a much greater amount of work in the same time, and more efficiently. All interested can see them in operation at our warehouse, or circulars describing them will be furnished by mail.
NEW YORK BELTING AND PACKING CO.,
1 13 Nos. 37 and 38 Park-row, New York.

AIKEN KNITTING MACHINE COMPANY, NO. 429 Broadway, New York, sole proprietors of J. B. Aiken's family and plantation knitting machines. Extremely simple, profitable and durable. Satisfaction guaranteed to all. Send in your address, every one, and full particulars will be sent to you, with illustration of machine, gratis. 22 13

C. L. GODDARD, AGENT, NO. 3 BOWLING Green, New York. Only Manufacturer of the Steel Ring and Solid Packing Burring Machines and Feed Rolls for Wool Cards, &c.
1 20*

BURNELL'S PATENT ROTARY PUMP—adapted to all purposes of pumping, from the well and cistern to the steam fire-engine. The most simple, durable and efficient pump yet made. Principal sales depot at No. 23 Platt-street, New York. [1 13*] SAMUEL B. LEACH.

PORTER'S CENTRIFUGAL GOVERNOR.—THE attention of parties troubled with irregular or unsteady power is respectfully called to this Governor, now coming into general use. It may be used in connection with any valve or cut-off, and will regulate the motion of the engine so perfectly that its entire load may be thrown on or off at once, without sensibly affecting its speed. I will send a Governor to any responsible person for trial; and if its action is not perfect under the above test, it may be returned. Prices exceedingly moderate. All orders and communications will receive prompt attention. Send for a circular.
Address CHAS. T. PORTER, 235 West Thirteenth-street, corner of Ninth-avenue, New York. A few reliable agents wanted.
1 tf.

MACHINISTS, &C.—INVENTORS' MODELS made by STOCKMAR & BAADE, No. 39 Greene-street, near Grand, New York City. 1 12*

STOVER MACHINE COMPANY, NO. 13 PLATT-street, New York—Manufacturers of Stover's Patent Eagle Molding Machine, for cutting and planing irregular forms of every description—illustrated in No. 25, Vol. I., SCIENTIFIC AMERICAN—and of the Stover & Coffin Patent Combination Planing Machine—illustrated in No. 19, Vol. II., SCIENTIFIC AMERICAN. Also, all kinds of Wood and Iron labor-saving machinery, Railroad Supplies, &c. &c.
1*

GRAY & WOODS' PATENT IMPROVED Planer; a combination of the Woodworth and Daniels' planers, particularly adapted for shop work, and for which we have obtained three patents and six medals. (See description and illustration in No. 6, Volume II., SCIENTIFIC AMERICAN.) Also, for sale, all kinds of wood-working machinery. Send for a circular. Address GRAY & WOODS, No. 69 Sudbury-street, Boston, Mass. 1 tf

FAN-BLOWERS—OF VARIOUS SIZES AND kinds, for smiths' fires and foundries, for sale by SAMUEL B. LEACH, No. 23 Platt-street, New York. 1 11*

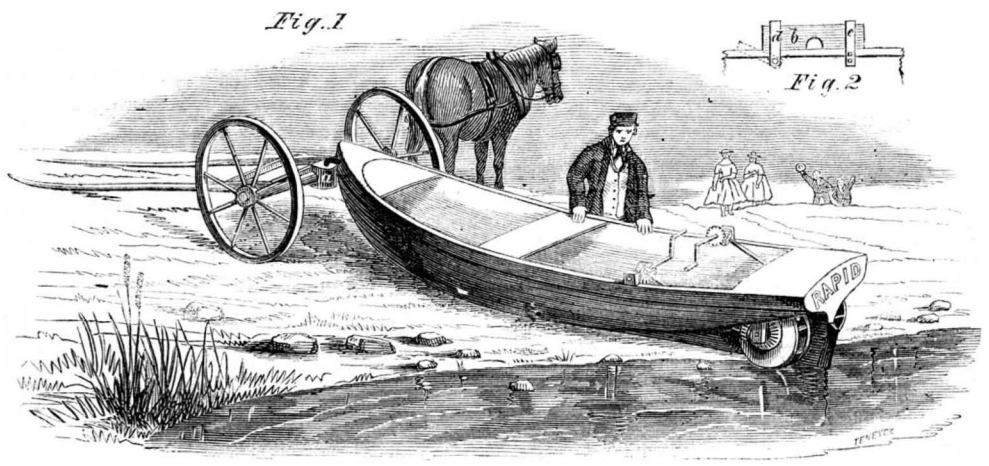
AMESSIEURS LES INVENTEURS—AVIS IMportant.—Les inventeurs non familiers avec la langue Anglaise et qui prefereraient nous communiquer leurs inventions en Francais, peuvent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seront recues en confidence.
MUNN & CO., Scientific American Office, No. 37 Park-row, New York.

© 1860 SCIENTIFIC AMERICAN, INC.

IMPROVED BUGGY BOAT.

We sometime since illustrated a buggy boat, patented by Perry Davis, of Providence, R. I., and we now present engravings illustrating another invention in the same department by the same prolific inventor.

There are three features in this invention, the suspending of the bow to the fore wheels, the hanging to the hind wheels, and the arrangment of the paddle wheels. The hanging of the fore wheels is shown in Fig. 1. The axle is made square in the middle, and a thick slab of india-rubber, *a*, is bent around it and secured by bolts. Through this india-rubber, behind the axle, a hole is



DAVIS' IMPROVED BUGGY BOAT.

made, through which passes the hook on the end of the bow of the boat; the hook being secured by a nut. The manner of hanging the hind wheels is shown in Fig. 2. A slab of india-rubber, *b*, is secured to the gunwale of the boat by the loop, *c*, at one end, and by the loop, *d*, at the other end. The loop, *d*, is connected to the gunwale by a bolt which operates as a hinge, allowing the loop to be turned down as shown by the dotted lines, thus releasing one end of the spring, *b*, for the purpose of admitting the axle under it, or for the purpose of removing the axle when the boat is to be detached from the wheels. It will be seen that this mode of hanging is exceedingly simple, secures the softness of the india rubber spring, and allows the most perfect turning motion to the forward axle.

The arrangement of the paddle-wheels is so clearly shown in Fig. 1, as scarcely to require any description. The keel is elongated at the stern, forming supports for the paddle-wheels, which are hung and connected by rods and beveled gears with the cranks, in the manner shown.

Further information in relation to this invention may be obtained by addressing the inventor, Perry Davis, at Providence, R. I.

OF WHAT IS THE SUN COMPOSED?—Professor Kirchoff, of Germany, has recently been making experiments with artificial lights produced by various substances, comparing certain of their effects with similar effects produced by the sun's rays, from which it is probable that the luminous atmosphere of the sun contains the metals sodium and potassium, and that it does not contain lithium in any considerable quantity. These inferences are drawn from the production of lines in the spectrum of flames containing these substances, corresponding in position with the dark lines in the solar spectrum.

WHAT IS TO BECOME OF THE "GREAT EASTERN?"

We copy the following reflections on the probable destiny of the great ship, from the New York *Herald*:—

The *Great Eastern* left the Chesapeake on Saturday morning, after her southern trip, and arrived here at six o'clock on Tuesday afternoon. She passed Long Branch at eleven o'clock in the morning. The monster ship, although she has been doing a handsome business here in the spectacular line, will hardly pay interest on her capital stock as an object of exhibition; and how she is to be made to pay in her legitimate trade is a problem. She comes and goes now on her pleasure coasting service without exciting any extraordinary interest. People gaze at her vast proportions as she steams up and down the bay, just as boys do at the great elephant in some menagerie procession parading the streets; but there is a deeper interest felt as to her future by the thinking portion of the community, and especially by ship-owners and merchants. What is to become of her when her exhibition season is over, and she returns to England? That is the question.

For example, there is a demand for ships in this country just now, owing to the abundant harvest which has blessed the land. Suppose that the *Great Eastern* were to take home a full cargo of breadstuffs to Liverpool, or of cotton, the influx of such an immense supply of either, all at once, would depress the market considerably. Or suppose she was to come out to this port full of dry-goods, and flood our market with some nineteen thousand tuns thereof, what a tumble down there would be in every article in the trade! Or, should she land an army of ten thousand emigrants at Castle Garden, all in a heap, what would we do with them? They would have to camp out in the streets, or on the Battery, for the emigrant depot would not hold a quarter of them.

Should she continue to trade between this country and England in any line, it would work a material change in our shipping trade and in every branch of commerce; but inasmuch as she would not pay expenses in this service, we hardly think she will try it. There was some talk of running her to Portland, Maine, and the Portlanders were sadly exercised because she did not make her first voyage to that port. But what in the name of Malthus and Cotton Mather would she do there? Why, in two trips to Europe, if her passenger lists were full, she would take away the whole population of that enterprising city, leaving its streets as deserted as Pompeii, and in six months she would denude the entire State of Maine of all its products and manufactures. We are very much afraid that the *Great Eastern* like the Erie Railroad, will have to go into bankruptcy. She cost originally four millions and-a-half of dollars, and she stands the present owners somewhere in about two millions and-a-half; but it is very likely, after all, that she will go into the hands of the holders of preferred stock, which amounts to half-a-million; and then to each of the owners she will be like an elephant in a gentleman's country garden. They have bought an elephant apiece, but they don't know what to do with it, or where to put it. If any one short of an Astor or a Vanderbilt were to be made a present of her to-morrow, he would be flat broke in a twelvemonth. It is a pity—but it is so.

AGRICULTURAL EXHIBITION PRIZES.

The annual exhibition of the Chester county (Pa.) Agricultural Society will be held at West Chester on the 5th and 6th of October next. Under the class of "Inventions, Models and Designs," as stated in the printed programme of the proceedings, we observe that one bound volume of the SCIENTIFIC AMERICAN will be given as a prize for *each* of the best designs for a farm house, barn, stable and carriage house, poultry house, spring house, smoke house and corn crib; also for the best model of a gate, sheep rack and cattle rack; and also for the best full-sized farm gate with a fastening, Chinese cane mill, washing machine, sausage-cutter, sausage-stuffer, and apple-parer.

We consider the award to be one of peculiar appropriateness and trust other societies will take the hint and do likewise. The committee and judges of this class are Messrs. Joseph C. Strode, James Cloud and Wm. F. James, gentlemen eminently qualified for the position. Here are sixteen volumes of the SCIENTIFIC AMERICAN—the acknowledged repertory of American inventions—offered as prizes for new improvements; what could be more appropriate? What other fair managers will adopt the same class of premiums?

NEW PROSPECTUS OF THE
Scientific American.

SIXTEENTH YEAR!

VOLUME III. NEW SERIES.

On the 1st of July commenced a new volume of this widely-circulated and popular journal.

Each number contains 16 pages of useful information, and from five to ten fine original engravings of new inventions and discoveries, all of which are prepared expressly for its columns.

The SCIENTIFIC AMERICAN is devoted to the interests of Popular Science, the Mechanic Arts, Manufactures, Inventions, Agriculture, Commerce and the Industrial Pursuits generally, and is valuable and instructive not only in the Workshop and Manufactory, but also in the Household, the Library and the Reading Room, as all articles, discussions and correspondence which appear in its columns are written in a popular manner.

To the Inventor and Patentee it is invaluable as the only reliable record of the progress of invention, at home and abroad, and of the weekly issues of American patents. No person interested in these matters, or who is engaged in mechanical pursuits should think of "getting along" without the weekly visits of this journal. The publishers invite attention to the extraordinarily low price at which it is furnished, making altogether the most valuable as well as the cheapest paper of the kind in the world.

Terms.

To mail subscribers: Two Dollars a Year, or One Dollar for Six Months. One Dollar pays for one complete volume of 416 pages; two volumes comprise one year. The volumes commence on the first of JANUARY and JULY.

Club Rates.

Five Copies, for Six Months.....$4
Ten Copies, for Six Months.....$8
Ten Copies, for Twelve Months.....$15
Fifteen Copies, for Twelve Months.....$22
Twenty Copies, for Twelve Months.....$28

For all clubs of Twenty and over, the yearly subscription is only $1 40. Names can be sent in at different times and from different Post-offices. Specimen copies will be sent gratis to any part of the country.

Southern, Western and Canadian money or Post-office stamps taken at par for subscriptions. Canadian subscribers will please to remit twenty-six cents extra on each year's subscription to pre-pay postage.

MUNN & CO.,
Publishers, No. 37 Park-row, New York.

© 1860 SCIENTIFIC AMERICAN, INC.